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Recreation and Land Use: the Public Benefits of Clean Waters

Preface

The American people have expressed their commitment to clean water through the actions of Congress and the results of public opinion polls, time after time.

The construction of wastewater facilities is first and foremost an environmental improvement program, designed to fulfill the dream to be able to fish in cleaned waters, swim in unpolluted lakes, stroll along pleasant shorelines and restore our spirits by the waterside in city and country alike. It has at the same time strengthened the economy, created more than 300,000 construction jobs and helped to build America's multibillion dollar recreation industry.

The water pollution control program should be used to obtain the broadest environmental benefits possible, especially in the realization of recreation opportunities. Congress has given us that opportunity — and responsibility.

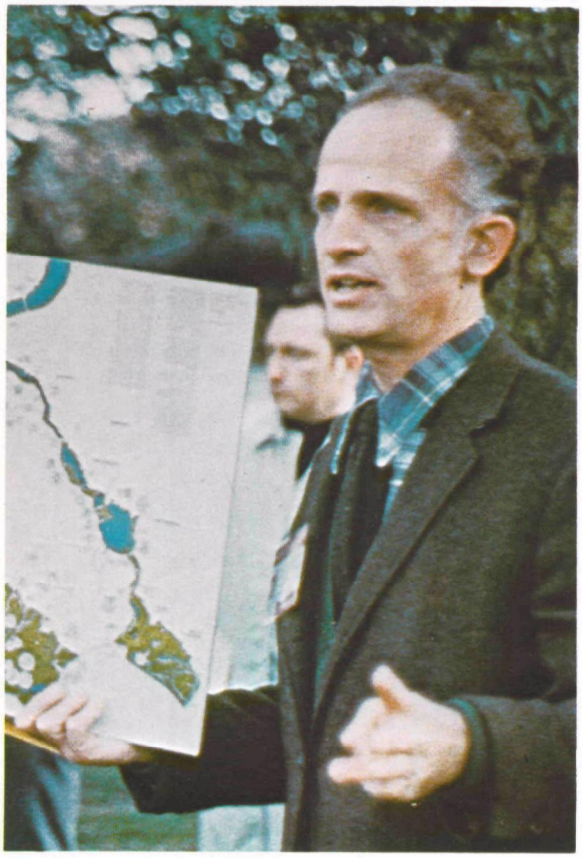
Douglas M. Costle
Administrator
Environmental Protection Agency

Water quality improvement brought about by Public Law 92-500 has truly been a national effort substantially assisted by public funds. Great strides have been made at all levels of government in the coordination of water planning. Much still can be done to assure public benefits of improved water quality.

As combined efforts result in still better water quality, we should strive to make clean water, this "newly created resource," more accessible for public recreation and fish and wildlife activities.

I applaud the amendments in P.L. 95-217 and pledge cooperation by the Department of the Interior to bring about the desired results.

Cecil D. Andrus
Secretary of the Interior



Recreation and Land Use: the Public Benefits of Clean Waters

(clockwise, starting upper left)

The EPA Mandate—
to improve water quality;

The Purpose of the Clean Water Act—
to achieve fishable and swimmable waters;

The Goal of the EPA and DOI Initiative—
to increase public access and benefits to cleaned up water;

The Need for Public Partnership—
to identify recreation and open-space opportunities associated with water quality management planning and wastewater facility construction.

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Background

This brochure is about *recreation and the re-creation of the water environment;* about conservation, wildlife, and shoreland protection potentials it presents for adjacent lands; and about the public's interest and responsibility to secure access to, and protect, these recaptured opportunities.

Principal Investigators

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Office of Environmental Review, EPA

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EPA Region 1 Water Division

The purpose of this particular publication is to present an overview of the recreation and land use benefits emerging from water quality improvements. It outlines steps that can be taken by interested citizens and public officials to obtain public benefits from coordinating recreation and water cleanup programs. It is designed to be an action manual of what needs to be done and how to do it.

Other Items in the series include a publication entitled *The Public Benefits of Cleaned Water: Emerging Greenway Opportunities;* a case study series prepared by the Office of EPA Land Use Coordination entitled *Mitigating Secondary Impacts from the Wastewater Facilities Program;* and an audio-visual presentation entitled "Public Partnership in the Clean Waters Program."

The initiative to secure the public benefits of clean water represents a combined effort by the Office of EPA Land Use Coordination, Office of Water Planning and Standards, and Office of Water Program Operations in EPA, and the Heritage Conservation and Recreation Service in the Department of the Interior. EPA and HCRS Regional Offices have also been closely involved in the effort.

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Introduction

Water cleanup, shoreland protection and access to recreation opportunities is a matter for citizen involvement as well as government action.

In the eyes of the public, the concept of coordinating water cleanup programs with public recreation efforts in order to assure recreation opportunities around newly cleaned water bodies is not an afterthought or an expendable luxury.

The citizens who have supported pollution control programs with their tax dollars have done so because they wanted opportunities for family and friends to enjoy the pleasures of swimming, fishing, boating, and recreation in the out-of-doors. It may not even occur to them that water pollution control is the program of one government agency, and provision of recreation facilities the province of another. In their eyes, the concept is a single one — clean water for *people* to enjoy.

It is for this reason that federal, state, and local officials whose basic responsibility is water pollution control cannot afford to lose sight of the larger questions of public access and water-oriented recreation. If the public cannot get near the water to enjoy it, taxpayers will care little — and indeed may not even realize — that tremendous strides are being made in water pollution control.

Eckardt C. Beck
Assistant Administrator
for Water and Waste
Management
U. S. Environmental
Protection Agency

Cleaning up water pollution is a first step in realizing the goal of recreating a damaged environment. A further step is needed too, however. The land surrounding newly cleaned water bodies must be protected from indiscriminate development, and made accessible to the public for recreation and outdoor enjoyment.

Much progress has been made in the past several years toward coordinating water cleanup and public recreation programs. Soon, however, we will be moving into a new phase, one which goes beyond demonstration programs toward making the concept of capturing the public benefits from cleaned waters an integral part of day-to-day Agency operations.

Congress has spoken clearly in the Clean Water Act of 1977. From now on, a town or country can receive federal funds from wastewater treatment facilities only if it analyzes the possibility of integrating recreation and open space opportunities.

EPA is taking its responsibilities seriously. We will do our best to see that citizens and local officials get the most for their tax dollars by coordinating water cleanup programs with recreation and open space programs.

This brochure outlines how, with a little innovative thinking, and a lot of perseverence, a community can establish an exciting mixture of public and private water-oriented recreation and park possibilities.

The dimensions of these opportunities nationally are enormous. Currently, some six thousand EPA-funded wastewater treatment plants are actively being planned or constructed. This represents a potential wealth of land either directly owned or controlled under easements by municipalities for hiking and biking trails or as shorefront parks.

The extent to which these potentials will result in your community obtaining more for its dollars invested in recreation; water cleanup, and shorefront protection measures rests largely in the hands of civic groups, working hand-in-hand with local government on projects of interest to the Environmental Protection Agency and the Department of the Interior. The major objective of this publication is to show you how opportunities can be identified and developed.

William N. Hedeman, Jr.
Director, Office of
Environmental Review
U.S. Environmental
Protection Agency


DANGER
WATER POLLUTED
NOT FIT
FOR SWIMMING
OR DRINKING

1
The Problem

The result of using streams, rivers, lakes and oceans to carry off America's wastes "somewhere else" was to make them dangerous to human health as well as for wildlife habitat.

Weeds, oozing muck, old tires, waterlogged debris, and the stench of chemicals and sewage have degraded the shores of rivers, lakes, and oceans for over a hundred years as waterways served to carry America's wastes "someplace else." Finally there was no place "else" left, and in the 1960's, a national push for clean water began.

In 1972, Congress enacted sweeping amendments to the Federal Water Pollution Control Act which strengthened the nation's course toward clean water, and declared as a national goal that all waters be made clean enough for swimming and fishing by 1983, and that the discharge of all water pollutants be stopped by 1985. A number of tough but workable measures were incorporated into the law to bring the nation step-by-step toward that goal. Chief among these were the National Pollutant Discharge Elimination System, which requires water polluters to obtain a permit and agree to a schedule of pollution abatement measures; the Construction Grants program, which provides funding for communities across the country to build municipal sewage treatment plants; and the State and Areawide Water Quality Planning Program, which fosters waste treatment planning and management strategies. Firm deadlines were given for achieving levels of water quality improvement.

Much progress toward clean water has been made since these measures went into effect in 1972. Industries are responding to their permit requirements and installing the necessary pollution control equipment. Cities, towns, and counties are building wastewater treatment plants at an unprecedented rate, with the aid of nearly $18 billion from the federal government between fiscal 1972 and 1977. Indeed, the Construction Grants program, in terms of annual expenditures, has become the largest public works effort in history, exceeding even the Interstate Highway program and the Apollo space program.

And, most importantly, the nation's waters are reflecting this cleanup effort. Fish are returning to where they have not been for decades; people who have never known their rivers and lakes as anything but open sewers, unfit for recreational use or aesthetic enjoyment, are seeing a transformation begin.

Ironically, however, this progress toward clean water and the even greater strides which will be made in the coming few years may open the way for indiscriminate development and degradation of the environment on the shores of the nation's waters. Furthermore, the public, which invested so much of its own tax dollars in water cleanup, could be denied access to these waterways and enjoyment of their newly regained aesthetic qualities.

It is the sad truth that much of the land along the rivers and lakes of the nation has been kept from residential or industrial development precisely because these water bodies were so foul and unpleasant that no one wanted to locate near them. A landowner in Massachusetts, for example, was once told by the Federal Housing Administration that his land along the Nashua River had "no value" because the condition of the river constituted a nuisance. Even fifty years ago, workmen on the Willamette River in Oregon refused to work at riverside construction because of the intolerable stench from the water.

As these two rivers and countless others like them become clean enough for fishing, swimming, boating, and just plain enjoying, waterfront lands will become prizes in the real estate market. The development pressure on these previously unused lands will be enormous. If nothing is done to control it, a number of undesirable consequences could occur:

- The land surrounding these rivers and lakes could become a jumble of unrelated developments, resulting in a blighted landscape and poor quality of life brought by haphazard growth even as water quality is rescued;
- As waterfront land becomes shopping centers, industrial parks, and private residential developments, and "no-trespassing" signs go up, the public would lose access to the newly enjoyable waterways which could provide tremendous opportunities for recreational use and aesthetic enjoyment;
- If this occurs, the primary benefits and monitary windfalls from the $18 billion of federal money spent on water pollution control would go to the few who are lucky property owners, land developers and real estate speculators, rather then to the many who pay their taxes to finance clean water programs;
- Since many types of land development contribute to water pollution—through erosion, runoff, or direct discharge of pollutants—much of the progress toward cleaner water could be undone if indiscriminate development of river- and lake-shores was allowed to occur.

2
The Opportunities

Environmental Education — Many communities have recognized the opportunities afforded by the water cleanup program such as at the Baylands Interpretive Center in Palo Alto, Cal.

These unfortunate possibilities enumerated in the preceding section however, need not occur. Indeed, from the same set of circumstances arises the potential for assuring that the public as a whole is able to derive the maximum personal benefit from clean rivers and enjoyable waterfronts. Since land along polluted waterways is low in value, it can be protected now—through federal, state, and community open space programs—and the public will reap a bonanza of recreational opportunities as the water becomes sparkling clean and fit for swimming, fishing, and boating, and the waterfront becomes enjoyable for walking and picnicking.

Since billions of dollars are being spent on recreation and water cleanup programs, the public's money can be stretched through proper planning and imaginative ideas for coordinating this spending.

In obtaining the most for your water cleanup dollar there is a basic strategy that ought to be adhered too, and that is:

- **Coordinated Acquisition** which means synchronizing state and federal open space acquisition with water pollution control schedules so that waterfront land is bought before cleanup is nearly completed and the land begins to soar in value.

Furthermore there are four basic approaches to carry out a coordinated acquisition strategy, each of which could become the basis for several separate projects, initiated one at a time. These are:

- **Multiple Use** which means obtaining the maximum auxiliary public benefit that a wastewater treatment plant or its site offers by, for example, accommodating environmental education programs or using available land within the site for public access to water, picnicking or play areas;
- **Recycling Outmoded Facilities** means imaginative re-use of abandoned treatment facilities for recreational or other compatible purposes, for example the refurbishing of settlement ponds into municipal swimming pools;
- **Joint Development** which means integrating the multiple-use potentials that a wastewater treatment facility offers as an element of a much larger recreation or conservation project encompassing other facilities as, for example, developing a city-wide trail system utilizing sewer rights-of-way along with and contiguous with highway, rail, electric power and other rights-of-way;
- **Environmental Education Programs** means seeking every opportunity afforded by the design of a new treatment facility, or the decommissioning of an older one, to promote public understanding, appreciation and protection for the newly rehabilitated water/land environment;

And finally there is a unifying concept that can be used as an overall policy of your group to organize a number of separate projects for a whole waterfront or waterway:

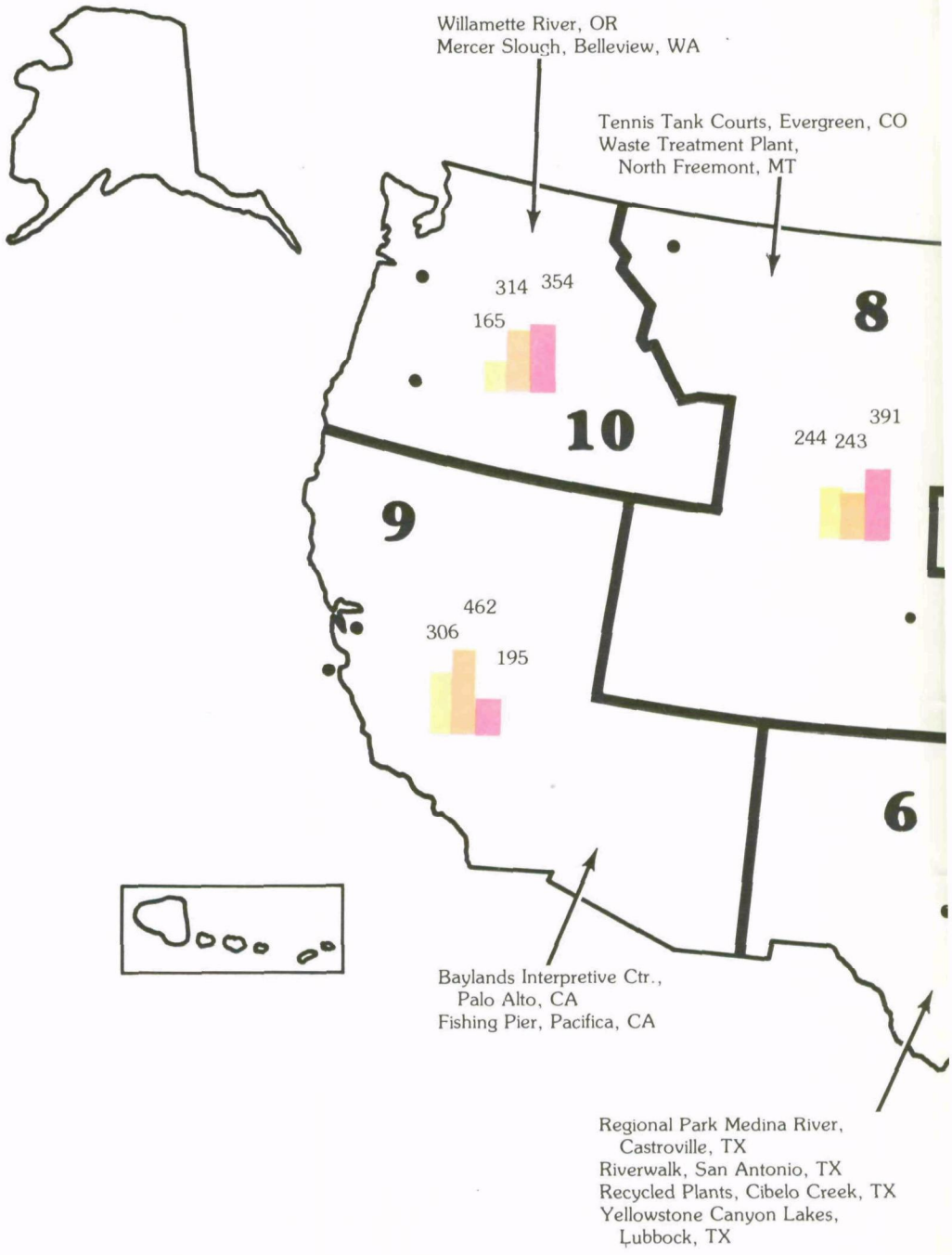
- **Greenways** which are corridors of open space and recreation land lining shorefronts and creating exciting linear parks.

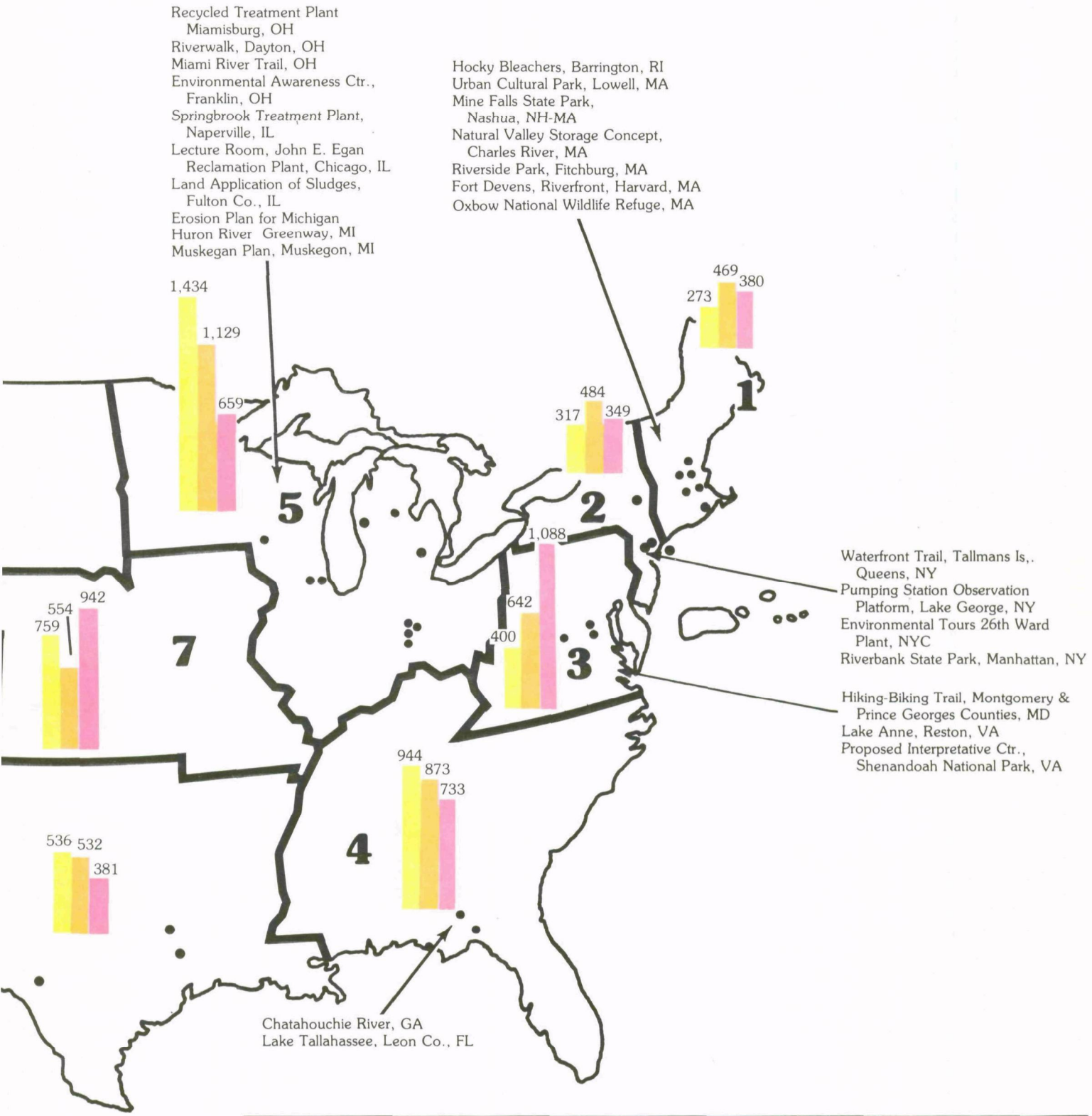
Taking advantage of such opportunities will ensure that the land uses along the nation's waterways contribute to, rather than work against, the goal of clean water. It will ensure that the benefits of the federal clean water programs go not exclusively to speculators and developers, but rather to all the citizens who paid for those programs through their taxes. It will provide further economic benefits in urban areas which can gain massive additions to their tax rolls by increasing the value of waterfront land through shoreline revitalization. And it will also ensure that clean water means not only the chemical make-up of the water itself, but includes the concept of a sparkling clear stream surrounded by an aesthetically pleasing landscape to which the public is guaranteed access.

Examples of Recreation/Water Cleanup Projects Discussed in this Brochure and Current & Future Potentials

While there are presently over 15,000 wastewater treatment plants in operation throughout the ten EPA Regions, opportunities for joint benefits between construction and recreation planning should abound between now and the year 2000. During the next 22 years, over 4,200 additional wastewater treatment facilities will be constructed. Additionally, another 1,200+ waste treatment plants are expected to undergo major enlargement and upgrading.

The bar chart identifies by EPA Region the numerous wastewater treatment plants that are in the Step 1 planning phase; Steps 2 and 3 design and construction phases; and the number of facilities expected to be constructed over the next two decades. Adding these construction projects together with other projects such as interceptor construction, and projects funded by other Federal Agencies the opportunities that can be capitalized on for joint construction and recreation planning become even more significant.





TOTAL 5,378 STEP 1 5,672 STEP II & III 5,472 Treatment plants to be constructed or enlarged and up-graded between years 1978-2000 (Figures from Tables 21, 23, 1978 Needs Survey)

Active construction projects as of 3/3/79
Source: Office of Water Program Operations


MERAMEC PARK LAKE
VISITOR CENTER
-WELCOME-
U.S. ARMY CORPS OF ENGINEERS

3

Enlisting Government and Other Help

Although the U.S. Environmental Protection Agency and the Heritage Conservation Recreation Service of DOI are the primary promoters of the concept of *the public benefits of cleaned water,* many other federal, state and local agencies as well as private sources have programs which can be incorporated into your recreation and shoreland protection strategy.

Citizens and public officials who seek to secure land use and recreation benefits from water cleanup programs will find that they need to enlist the help of an array of government agencies at the federal, state, and local levels. The multitude of programs, each with its own timetable, regulations and resources, can seem confusing. This section sketches an overview of the major programs that can be useful.

The concept of coordinating water cleanup programs with recreation and land use is a new one and many officials have little or no experience with it. Thus the Environmental Protection Agency has taken a number of steps to bring these ideas to the attention of planners, sanitary engineers, public officials, park and recreation professionals, and the general public.

Increasing Awareness of the Concept

Impetus for water cleanup and the land activities first began at a national conference held in Boston during November, 1975. Sponsored by the U.S. Environmental Protection Agency in cooperation with the Department of the Interior and the Conservation Foundation of Washington, D.C., the conference was designed to dramatize the land-use impacts of federal clean water programs and the recreation opportunities unfolding as a result.

The three days of speakers, panels, case experiences, workshops, and field trips brought together citizens and officials, those who were concerned with land use and those who were concerned with the water, those who were skilled in pollution control and those who were skilled in open space preservation and recreational use. The coalition of environmentalists who had instigated the nation's water cleanup drive joined with its engineering and legal implementors to forge new strategies. The conference sparked awareness and understanding by its diverse participants, who returned to their communities around the country with an eagerness to take advantage of these new opportunities.

In the New England region, where the conference had taken place, particular strides were taken in advancing the conference recommendations to provide an example of effective action by agency officials. in the final hours of the conference, the Regional Administrator of the Environmental Protection Agency and the Bureau of Outdoor Recreation* signed a Statement of Coordination which specified actions which the two separate agencies would take both jointly and independently to coordinate their activities to secure the maximum public benefit from water cleanup and outdoor recreation programs.

The New England Regional Office of the Environmental Protection Agency prepared and distributed a brochure on "Multiple Use of Waste Treatment Facilities and Rights of Way." The Agency also alerted the chairmen of conservation commissions in communities where wastewater facilities were planned of the opportunities for simultaneous development of recreation facilities. Letters were likewise sent to the state water quality and recreation officials in the region. Additionally, a workshop was held for engineers designing treatment facilities to acquaint them with recreation opportunities and let them talk with other engineers experienced in multiple use designs.

Meanwhile, other activities have been taking place in other regions, and at the national level. Proceedings of the Water Cleanup and the Land Conference were published to broadcast its findings and recommendations. In the fall of 1978 a Joint Memorandum of Understanding between EPA and the Department of the Interior was signed at the national level, similar to the Statement of Coordination between the regional offices in New England.

To further cement the working relationship between recreationists and water quality advocates, the Environmental Protection Agency sponsored a research and education project on the part of the National Recreation and Parks Association. The project was designed to get the word out to park and recreation professionals around the country, as well as to interested citizens and local officials. It included preparation of publications, case studies, audiovisuals, and workshops.

To address professional audiences, EPA also held a

**A reorganization in 1978 included BOR in a new agency within DOI named The Heritage Conservation and Recreation Service (HCRS).*

Beginning in October 1978, *"The Administrator shall not make grants—[for] treatment works unless the grant applicant has satisfactorily demonstrated to the Administrator that the applicant has analyzed the potential recreation and open space opportunities in the planning of the proposed treatment works."*

Section 201(g)(6)
Clean Water Act of 1977.

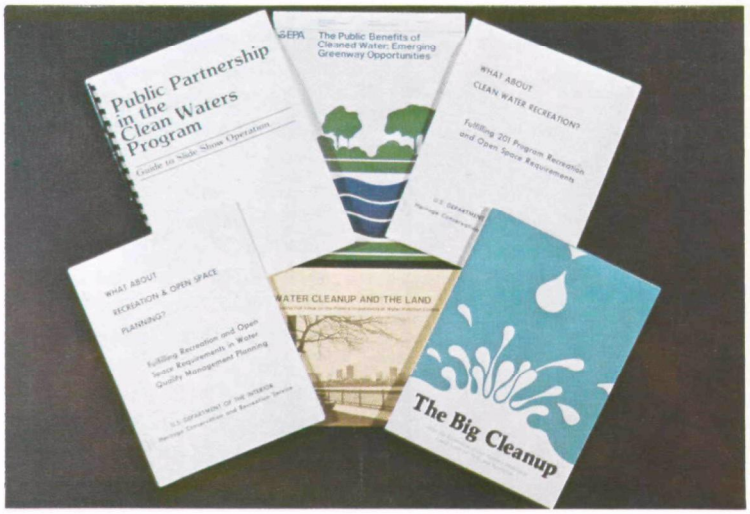
conference and joint agency meeting with HCRS in Chicago in the autumn of 1978, to bring together waste treatment engineers, water quality planners, recreation specialists and local officials from around the country to focus their attention on EPA's commitment to providing recreation opportunities in its water quality projects.

The water cleanup and the land concept has obtained bi-partisan support. Initiated by former EPA Administrator Russell Train during the Ford Administration, the program has been heartily endorsed by current EPA Administrator Douglas M. Costle. The water cleanup and recreation theme is very much in tune with the Carter Administration's direction of coordinating diverse federal programs to maximize the benefit to the taxpayer. Congress, too, has strengthened EPA's water cleanup program through the new Clean Water Act of 1977 which added action-forcing provisions to spur the implementation of coordinated land use and water cleanup.

Gaining an understanding of the different programs of government agencies at the federal, state, and local level is an important step in itself toward coordinating water cleanup efforts for maximum public benefit. Traditionally, recreationists and water cleanup advocates have been largely unaware of the procedures, requirements, and timetables of each other's programs. Now, however, a working knowledge of all of these programs has become essential.

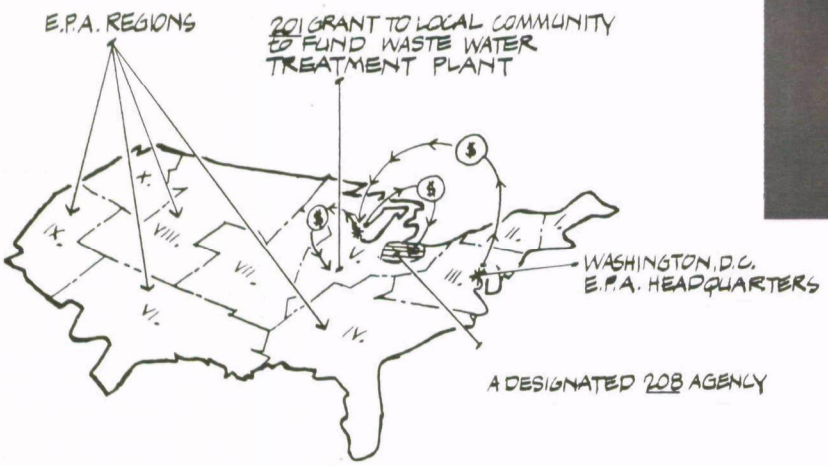
The two principal federal agencies involved in water cleanup and the land programs are the U.S. Environmental Protection Agency, and the U.S. Department of the Interior. But, of course, other agencies play important roles as well—not only other federal agencies, but state and local governments too. Agencies of state and local government not only have their own recreation and water quality programs, but are key decision-makers in carrying out programs which are funded by the federal government.

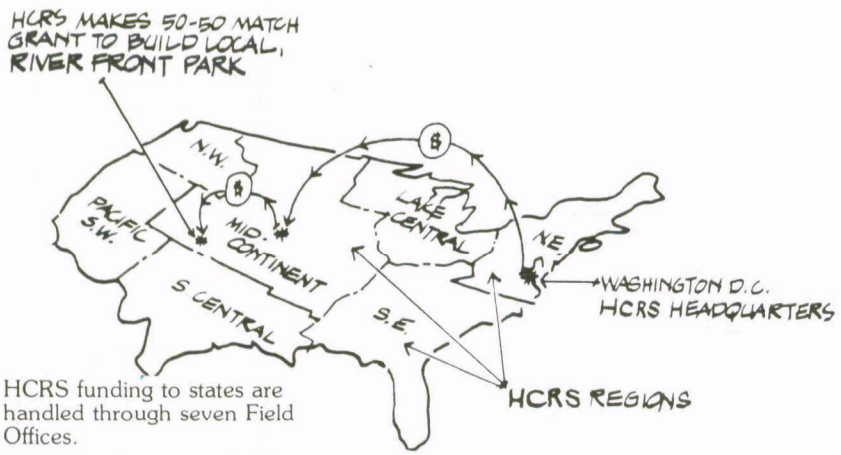
It is important to be aware of the regulations governing different programs, the timetable by which each operates, and the procedures used to grant funds and take other actions. These vary for each and every program, and it is important to contact agency officials well in advance to make sure that the opportunity to participate in a program is not foreclosed because of timing or procedural mistakes.



Helpful brochures relating recreation and shoreland protection opportunities to wastewater treatment facility construction and water quality management planning are continually being prepared or updated by EPA, HCRS and others.

EPA funding to states, regions and localities are handled through ten Regional Offices.





HCRS funding to states are handled through seven Field Offices.

Programs of the U.S. Environmental Protection Agency

The Federal Water Pollution Control Act makes it a national goal that the discharge of water pollutants be eliminated by 1985. As an interim goal, it further establishes the policy that by 1983 water should wherever possible be made clean enough for fishing and swimming. A variety of programs have been established to bring these goals to reality. These programs are known by the section of the Act which authorized them. The principal ones relating to water cleanup and the land are:

Section 201 authorizes the Construction Grants program to assist local governments in building wastewater treatment facilities. Federal funds are provided to cover 75% of the cost for municipal treatment plants. The program is administered through the state water quality agencies, which often provide state funds to further assist communities. Section 201 requires use of best practical waste water treatment technology in any plant built with federal assistance, and the study of alternative waste management techniques before any project is funded. When the Act was amended in 1977, Congress required that recreation and open space opportunities be considered in every treatment facility funded by EPA.

Section 106 requires that states establish criteria for deciding priorities in the allocation of Construction Grants money, and publish an annual priority list of projects to receive funds. Each state's '106 submission,' including the priority list, is reviewed in an annual meeting with the appropriate EPA regional office, and interested citizens. The priority list provides a major opportunity for state water pollution control agencies to coordinate their programs with park and recreation agencies.

Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), the permit system which requires all water polluters to clean up their discharges on a legally enforceable, step-by-step timetable. By 1977, the NPDES permits require use of the best practical water pollution control technology; by 1983, use of the best available technology economically achievable. Individual states can take over administration of the NPDES permit system if they demonstrate the ability to manage the program effectively and agree to follow the federal requirements.

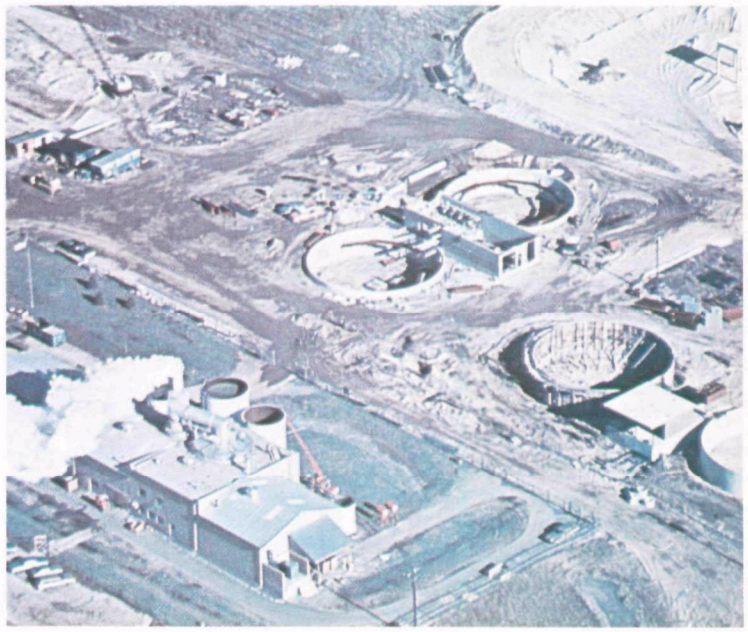
Section 208 sets up the Areawide Waste Treatment Management Planning process, also known as "208 planning." The Water Pollution Control Act provided for 208 planning in recognition of the fact that how land is used is a major factor in the control and prevention of water pollution. Important features of 208 planning are that it is done on a regional basis, that it deals with non-point sources of pollution (erosion, sedimentation, farm run-off, etc.) as well as point sources (industrial or municipal discharge pipes), and that it requires regulatory mechanisms to assure that pollution does not develop in the future. Shoreland uses must be examined to protect water quality. The 1977 Clean Water Act amended Section 208 to require identification of recreation and open space opportunities resulting from improved water quality including "increased access to water-based recreation." All permits issued under Section 402 and all construction grants made under Section 201 must be in conformance with approved 208 plans.

Section 303 requires each state to establish a State Continuing Planning Process which sets its major objectives and priorities for preventing and controlling pollution over a five year time horizon. Water Quality Management Basin Plans are also prepared for individual river basins. These establish specific programs and targets for water pollution prevention and control, and establish policies to guide decision-making over a twenty year time frame.

Section 314 authorizes the "Clean Lakes Program" which provides technical and financial assistance to restore fresh-water publicly owned lakes. Funding is available to states including grants for a variety of restorative projects which encompasses lake recreation resources.

"Any plan prepared shall include, but not be limited to—the identification of treatment works necessary . . . over a twenty year period . . . and an identification of open space and recreation opportunities that can be expected to result from improved water quality, including consideration of potential uses of lands associated with treatment works and increased access to water-based recreation."

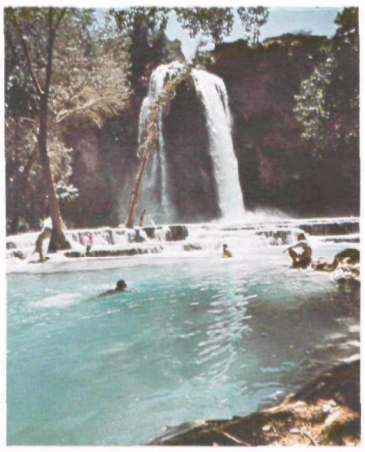
Section 208(b)(2A)
Clean Water Act of 1977.



Unprecedented numbers of wastewater treatment facilities are being constructed with EPA funding providing opportunities for public access to waterfronts.

"The substantial increases in Land and Water Conservation Fund authorizations by Public Law 94-422 provides an opportunity to accelerate the acquisition of needed outdoor recreation areas. They also present a greater challenge to maximize the utility of those funds. "Federal agency plans and State Comprehensive Outdoor Recreation Plans should give special attention to this once-in-a-generation opportunity to acquire waterfront lands. We particularly need access to rivers, lakes, and streams undergoing cleanup, especially in urban areas where close-to-home recreation opportunity is nonexistent or in short supply."

Chris Therral Delaporte
Director, Heritage Conservation and Recreation Service



The "Old Swimming Hole" of yesterday could again become commonplace through the clean water programs.

Programs of the U.S. Department of the Interior

Within the Department of the Interior, three major bureaus deal with issues relating to water cleanup and the land: the Heritage Conservation and Recreation Service, The Fish and Wildlife Service, and the National Park Service.

The Heritage Conservation and Recreation Service is chief among these. HCRS administers the Land and Water Conservation Fund, which provides money to states, cities, counties, and towns for acquisition and development of outdoor recreation areas and facilities. The grants cover 50% of the total cost, and are given through a state agency designated by the governor. In addition to covering outright acquisition and development, the Land and Water Conservation Fund provides aid in the form of 50% matching grants, for preparing Statewide Comprehensive Outdoor Recreation Plans (SCORP's). Indeed, to be eligible to receive grants for acquisition and development of specific parcels, a state must have a SCORP which identifies needs and priorities for acquiring and developing all types of outdoor recreation resources within the state.

In addition to granting aid to states and municipalities, the Fund is the source of money for acquisition of federally owned recreation lands such as seashores, lakeshores, wild and scenic rivers, or trails. At least forty percent of the Fund annually provides for this federal land acquisition, with the remaining amount providing matching grants to states and localities. In 1977, the Fund was substantially increased to $600 million. Then, Congress increased the Fund to $750 million for fiscal year 1978 and raised the figure to $900 million for fiscal year 1979.

In addition, to its grant programs, HCRS also has a "technical assistance program," through which it provides advice and information to state and local governments as well as private interests on planning, developing, financing, and managing outdoor recreation programs.

The *Fish and Wildlife Service* is concerned with water quality and waterfront land use to protect streamside habitat and ensure the ability of waterways to support diverse aquatic life. In addition to providing advice and influencing the decisions of other agencies of government, the Service has two land acquisition grant programs of its own: the Dingell-Johnson program, to provide sport fish habitat; and the Pittman-Robertson program to provide game and nongame wildlife habitat. The grants are made to state fish and game departments.

The *National Park Service* not only administers national parks and national recreation areas, but has a "technical assistance program" similar to the Heritage Conservation and Recreation Service. The Park Service provides advice and information to state and local agencies in planning, developing, and managing park and recreation areas to best meet the needs of the public. The Service conducts studies for designations under The Wild and Scenic Rivers System and The National Trails System.

Other Federal Programs

The U.S. Department of Agriculture

A number of divisions within the Department of Agriculture conduct programs relating to water cleanup and the land:

The *Agricultural Stabilization and Conservation Service* conducts the Water Bank Program and the Agricultural Conservation Program. The Water Bank Program undertakes ten year agreements with owners of wetlands which are important breeding and nesting areas for migratory waterfowl, whereby the owners agree to preserve their land in exchange for an annual payment. The Agricultural Conservation Program offers grants to farmers and ranchers to undertake soil, water, and wildlife conservation practices.

The *Farmer's Home Administration* offers guaranteed loans for a variety of purposes—

- Farm Operating or Ownership Loans, which may, in addition to direct farm uses, be used by farmers to develop or operate recreation facilities on all or part of their land;
- Recreation Facility Loans, which are also available to farmers to enable them to convert all or part of their farm into an income producing facility;
- Resource Conservation and Development Loans, which can be made to local nonprofit corporations or government agencies in areas which are designated Resource Conservation Districts, and can fund a variety of resource development activities including public water-oriented recreation opportunities;
- Watershed Protection and Flood Prevention Loans, which provide loans to help pay the local share of watershed improvement projects, including fish and wildlife development projects and public water based recreation projects, and are made to government agencies or non-profit organization.
- Community Facilities Loans, which are made to rural communities with populations of less than 10,000, for the purpose of constructing or improving a variety of

community facilities including public recreation areas.

The *Forest Service* offers a General Forestry Assistance program, through which it makes grants to state forestry agencies to enable them to help woodland owners and associations in forest management, including land use planning and preparation of wild and scenic river studies. The Forest Service also administers Youth Conservation Corps grants to states, which provide funds for the employment of 15-18 year-olds in conservation work on non-federal public lands and waters.

The *Soil Conservation Service* has two programs of interest. The first is the Resource Conservation and Development Program, which offers grants and advisory services to rural communities for a variety of resource-related purposes including development of water-oriented recreation and enhancement of fish and wildlife resources. The second is the Small Watershed Program, which provides grants and advisory services to government or private non-profit agencies in watersheds of less than 250,000 acres, for construction projects including developing public water-oriented recreation facilities or improving fish and wildlife resources.

The U.S. Department of Commerce

The *Office of Coastal Zone Management* within the Department of Commerce administers an important planning program which gives grants to coastal states (including those bordering on the Great Lakes) to develop plans for managing their coastal areas. The plans are developed by state agencies with the participation of citizens and local officials, and specify economic objectives as well as recreation and land preservation goals. Once completed, the state plans are reviewed by the federal government, and if approved according to specified criteria, a state receives further funds to implement the CZM plan. In addition, all federal agencies must, to the maximum extent possible, make their actions conform to approved state plans. Coastal Zone Management Planning is a powerful tool for deciding uses of coastal land and resources.

In addition to the planning program, the Office of Coastal Zone Management conducts the *Coastal Energy Impact Program.* This provides states and communities that are adversely impacted by coastal energy-related development with funds for a variety of purposes, including the restoration or replacement of recreation areas damaged by such development. Such funds will be provided only when the fault for damage cannot be assigned to a specific party, since in cases where fault can be assigned, that party should pay for restoration itself.

The Office of Coastal Zone Management conducts the *Estuarine Sanctuaries Program,* which provides funds to assist states in the acquisition, development, and operation of marine sanctuaries in coastal estuaries. The purpose of the program is to provide areas for study of human and natural processes occurring in estuaries.

The CZM Office can also grant funds for land purchases which provide access to public beaches and other coastal recreation and natural resource areas.

The U.S. Department of Defense

Army Corps of Engineers

The *Army Corps of Engineers* has responsibility for flood protection programs and other major water-related construction projects around the country. The Corps is also responsible for maintaining harbors and ensuring the navigability of waters, and through these responsibilities can become active in river and harbor cleanup efforts.

The Corps' traditional flood-control measures have involved construction of large dams which—though they can provide artificial recreation lakes—usually destroy the natural qualities of a river. Now, however, under the mandate of the 1974 Water Resource Development Act which requires consideration of non-structural alternatives, the Corps is experimenting with new flood control techniques which can provide significant opportunities for shoreline land preservation. One such project is described below.

Canoeing on the upper reaches of the Charles River, "engineered by nature," and protected by efforts of the Watershed Association.

The Natural Valley Storage Concept on the Charles River

As it meanders through Massachusetts on its way to the Atlantic in Boston, the Charles River is a marvel of what its Watershed Association calls "Engineering by Nature." Chronically low on water, the River is augmented by marshlands throughout its course which feed in through tributaries and add their strength to the flow of the Charles. In sudden storms or snowmelts, the wetlands serve the opposite purpose, holding water back like a sponge until the River can safely carry it.

When the Corps of Engineers was directed by Congress to design a flood control progarm for the Charles, the role of these wetlands became evident. Although flood crests from the last twelve mile stretch of the River reach downtown Boston within an hour or two, those from upstream take four or five days. The difference—upstream, the wetlands were doing their job; downstream the water was racing off of rooftops and pavement.

Thus, the Corps proposed the Natural Valley Storage concept for the Charles, and received an

Environmental Protection Award from the Charles River Watershed Association as a result. Congress has authorized the Corps to proceed with wetlands acquisition. Natural Valley Storage means that rather than controlling floods by costly dams, the same job will be done in harmony with nature by preserving, through easement or full purchase, 8,422 acres of swamps, marshes, and wet meadows—about half the wetland acreage in the watershed. As the report of the study committee read:

"The logic of the scheme is compelling. Nature has already provided the least-cost solution to future flooding in the form of extensive wetlands which moderate extreme highs and lows in stream flows. Rather than attempt to improve on this natural protection mechanism, it is both prudent and economical to leave the hydrologic regime established over millenia undisturbed. In the opinion of the study team, construction can add nothing."

In addition to providing flood control, of course, the land acquisition of the Natural Valley Storage method provides open space, and assures the protection of recharge areas for groundwater supplies.

The U.S. Department of Housing and Urban Development

The Department of Housing and Urban Development makes "Community Development Block Grants" to states and communities for urban renewal activities and acquisition, rehablitation, and construction of community facilities. These can include public park and recreation areas. Also HUD's Flood Insurance and Floodplain Management Program could be effectively used for recreation purposes or shoreland preservation.

The U.S. Department of Labor

Under the Comprehensive Employment and Training Act, the Department of Labor provides funds to states and communities to hire unemployed or underemployed persons for public service work. Many communities have used these CETA workers to supplement park and recreation staffs. In 1977 Congress added a program called the Young Adult Conservation Corps for labor intensive conservation work on public lands in areas with substantial unemployment.

Regional Commissions

The Public Works and Economic Development Act of 1965 authorized multi-state "regional commissions" to help states plan for economic development. These regional commissions sometimes grant "Supplements to Federal Grant-in-Aid" to states and communities which cannot raise the matching funds necessary to take part in federal programs to encourage acquisition of land or construction of facilities.

State Agencies

State agencies play a crucial role in water cleanup and the land, because many of the important federal programs are largely administered through state governments. Thus, for example, crucial decisions in EPA water quality programs—particularly on construction grants for municipal wastewater facilities—are made by state water pollution control agencies. Likewise, priorities for expenditure of federal Land and Water Conservation Fund monies are set within each state by state recreation officials.

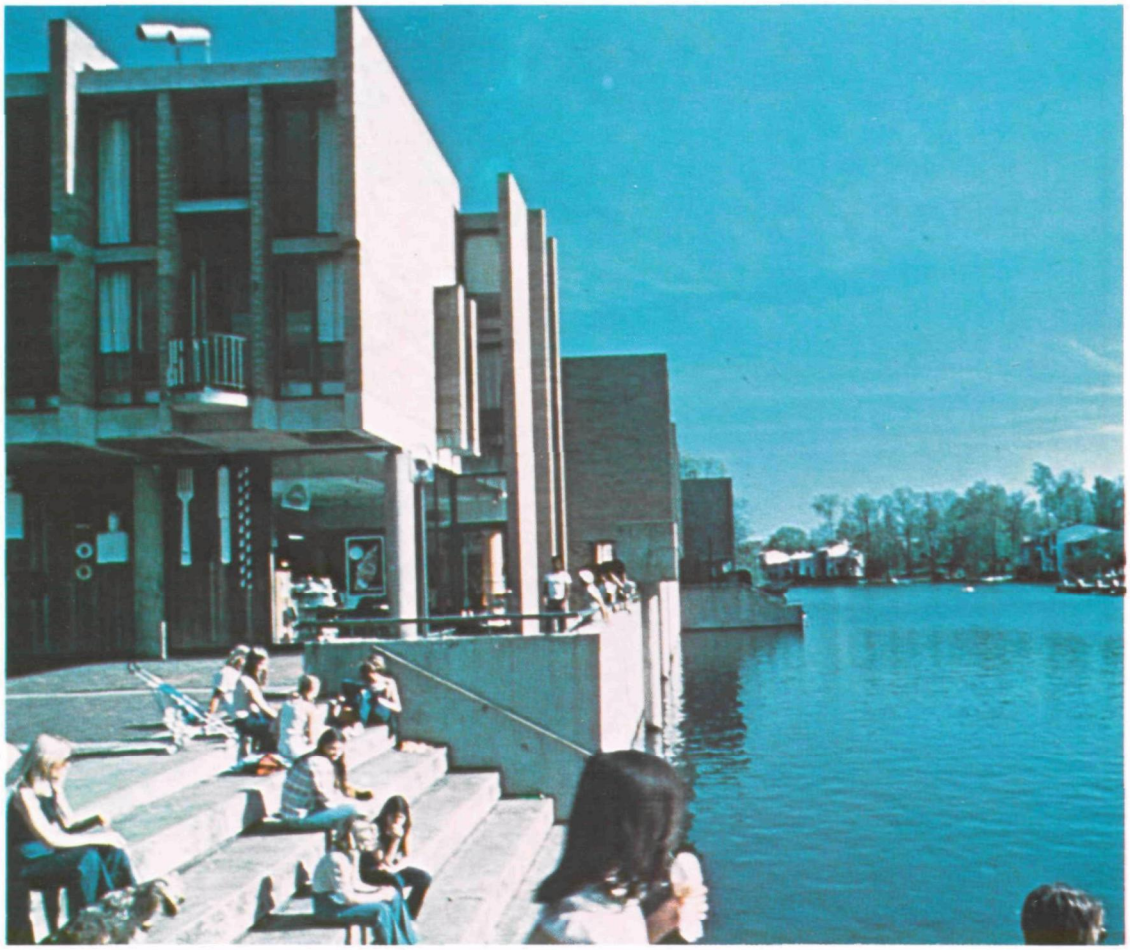
Many states also have their own programs which complement federal activities. Many states, for instance, have programs for assisting communities with construction of wastewater facilities, to further reduce the amount of funds which must be supplied by local governments. Many states also have programs to provide funds for recreation land acquisition, or to designate state scenic and wild rivers. State planning agencies and fish and wildlife agencies can also provide considerable help in water cleanup and the land activities.

Local Agencies

City, town, and county governments have numerous bodies which should participate in efforts to coordinate recreation and water quality programs. These include planning and zoning boards, conservation commissions, park and recreation boards or agencies, sewer commissions, public works departments, and others. Elected officials such as mayors, town

councils, or county boards of supervisors often make major decisions in water cleanup and the land programs.

Even when federal and state governments supply the bulk of funds for a project, the local government still plays a pivotal role and has a major voice in decisions. In the case of local purchase of recreation land, municipal officials must initiate the request for federal and/or state assistance, and supply their portions of the funds. In EPA construction grants projects, municipal governments must not only pay the local share of wastewater facility construction costs, but must also provide the land for the plant and the easements for the collection system, as well as assume the burden for operation and maintenance once the facility is completed.



Lake Anne in the "New Town" of Reston, Virginia was made possible by clean water, innovative developers, and cooperative public officials.

Other Non-Governmental Sources

Industry and Commerce

Many industrial and commercial corporations that are located in your community or state—or that conduct business there—often have a budget set aside for funding worthwhile community projects. These sources are obviously not advertised, and require diligence and resourcefulness on your part to identify them. A talk with your local Chamber of Commerce or with state or community development officials would be a first step in identifying the most promising companies. Companies may secure tax advantages through donations of waterfront easements or other gifts.

Philanthropic Sources

A number of organizations are created for the sole purpose of improving the quality-of-life of a particular community or region. Again a talk with the local Chamber of Commerce or other development officials suggested above might also identify promising philanthropic organizations. However, the number of these organizations are small and may not exist in your locality. But be imaginative, a donation by a wealthy individual can often qualify for tax deductions. You have to do the homework to point out the advantages.

Professional and Public Interest Groups

Even though professional and public interest groups may not have money to contribute to your recreational project, they often have a good substitute for money in the bank—knowledge that can and is often volunteered. Local or regional chapters of architectural, engineering or planning organizations can be sources of expertise at minimal or no cost to advance your cause and organize your arguments for the public official.

4

Water Cleanup, Recreation and Conservation Opportunities

Securing full value on public investments in water cleanup involves:

Public Access to cleaned up water;

Easements for hiking and biking over interceptor rights-of-way; and

Shoreland Protection to prevent repollution by new development attracted by successful water cleanup.

The firm deadlines set by Congress and the large amounts of money spent for water pollution control are a driving force inexorably moving the nation toward clean water. Communities that want to incorporate recreation and land use benefits must operate within its deadlines and framework. But this framework provides many opportunities. Sewer systems built to collect wastewater can incorporate hiking and biking trails. The treatment plant site—or even the facility itself—has a number of potentials. Finally, the clean water that results is returned to the natural environment where it presents its own recreation and ecological possibilities.

The outstanding opportunities for recreational use and enjoyment of rivers, lakes, and streams now unfolding as a result of water cleanup programs will not happen by themselves. In each community which wants to enjoy the full benefits of its tax expenditures on water quality, in each city and town and county which wants to have public parks and pleasant open space along its waterways, citizens and officials must work together to turn these possibilities into realities.

The following pages outline the major categories of recreation opportunities unfolding as a result of clean water progress. In each category, the discussion is oriented to how *you* can bring about action in your community. The various sections each contain a description of the concept, an explanation of why it is desirable, a listing of the agencies and types of people important to success, a discussion of how to go about implementing the idea in your community, and, finally, a description of successful cases from around the country.

As you read through these various sections, as you consider the possibilities in your community, and as you become involved in bringing them to reality, bear in mind that a thorough knowledge of water cleanup and recreation programs is the first prerequisite for using them to maximum public benefit. Consider a variety of alternatives—in terms of types of projects, specific sites, and ways to implement your goals—without shutting off viable choices too soon.

Put effort into developing a constituency, because such efforts are always worthwhile. Publicize the opportunities, work to make other people catch your vision. Seek to involve not just the natural constituency for recreation, open space, and environmental projects, but as wide a diversity of people as possible. Involve people in planning and decision-making—don't limit their role to passive agreement with plans developed by others. Finally, don't be easily deterred. There are many successful recreation and open space projects whose proponents could easily have given up over a seemingly insurmountable obstacle—but they persisted, and went on to achieve their goal.

Community Involvement
Coordinating Acquisition and Protection Measures

The Concept

Coordinated acquisition and protection means synchronizing open space protection programs with water cleanup schedules so that waterfront land is given high priority, and purchases timed so that property is bought in advance of dramatic pollution abatement and the soaring property values that will accompany it. This is the central element in the effort to secure full public benefit from emerging clean water opportunities.

Coordinated acquisition does not, of necessity, imply new spending on open space acquisition. Rather, it focuses on coordinating spending of the many existing federal, state, and local programs in this area discussed in Section Three. In some cases, individual states or communities may step up their commitment to open space acquisition in order to meet the opportunities provided by matching funds, but overall, the problem is more one of redirecting acquisition priorities than one of increasing expenditures.

Why Is Coordinated Acquisition and Protection Desirable

Coordinated acquisition and protection is first and most clearly desirable because it provides a major bargain for the public dollar, by concentrating expenditures on land which is inexpensive now compared with its potential value—a value which is about to be realized through the progress of clean water programs. By putting this prime land in the public's hands, coordinated acquisition and protection ensure that the benefits of tax expenditures on pollution control go to the public, not to private real estate developers.

Coordinated acquisition means that a large share of new public recreation areas will be water oriented, satisfying the popular urge for swimming, fishing, boating or other water sports, or even just the chance to walk along the shore, or sit and watch the water. People have a natural attraction to water, an attraction which has drawn them to the rivers and lakes of America even when these were less than pure. As these waterways become increasingly attractive and more and more usable for a variety of water sports, coordinated acquisition and protection is the key to satisfying the recreation demands that will be felt by park and recreation agencies across America.

And not least, coordinated acquisition and protection helps to prevent the pollution of cleaned rivers and lakes through erosion, runoff, and other forms of "non-point source" pollution that would accompany indiscriminate development of shorelines for commercial purposes, or intensive residential development at the waters edge. These pollution sources represent a serious threat to the nation's waters, and unless controlled could undo much of the clean water progress obtained through regulation of factories, municipal waste discharges, and other "point source" polluters.

The Major Actors

One of the most important people in bringing about coordinated acquisition and protection is *YOU*, whoever you are, whatever your job or civic activities. The job of bringing about the coordination of programs at three levels of government—federal, state, and local—on two separate subjects—recreation and water pollution control—under the jurisdiction of separate agencies, is obviously a difficult one. You can help by doing your part to activate and bring together interests such as these:

- *city, town, and county park and recreation agencies, conservation commissions, planning boards, and other municipal bodies,* who can participate in developing and evaluating priorities, may have their own sources of local acquisition funds, can apply for state and federal assistance, and can also help to supply a constituency for coordinated acquisition and protection as a concept as well as for the protection of specific parcels of land;
- *mayors, city councillors, selectmen, boards of supervisors, and other local elected officials,* who can appropriate local funds, seek federal and state aid, and add their important voices to the call for coordination of recreation and water cleanup programs;
- *state recreation and land acquisition officials,* who not only may have their own sources of

A treatment plant in Castroville, Texas is designed to fit in unobstrusively in its regional park.

A well informed public is the key to benefiting fully from "fishable and swimmable" waters.

funds, but also control the distribution of federal Land and Water Conservation Funds within their state;

- *state water quality officials,* who administer state and federal water quality programs, and are key people in targeting areas where pollution progress is most dramatic and therefore the need for coordinated acquisition and protection greatest;
- *regional "208" water quality planning and management agencies,* which can help to identify priority areas, and develop specific implementation steps for shoreland protection;
- *state planning offices,* which can be instrumental in coordinating separate programs of different agencies, as well as in identifying areas which deserve priority efforts;
- *federal agencies* such as the Heritage Conservation and Recreation Service and the Environmental Protection Agency, which, though programs are largely administered at the state level, are the ultimate source of most available funds, and can help redirect priorities by lending their support;
- *local, regional, and statewide civic groups,* including watershed associations, fish and hunt clubs, hiking groups, sports associations, chambers of commerce, environmental groups, community service organizations, and many others, who can provide a constituency for coordinated acquisition and protection efforts— bringing it to the attention of government officials, politicians, and the public at large;
- *state legislatures,* which can help by establishing a state open space acquisition program if none yet exists, ensuring adequate funding for it if one already does exist, and, if necessary, legislatively redefining priorities to put them in line with the idea of coordinated acquisition;
- *private landowners,* whose help is essential in cooperating with recreation and open space agencies and in resisting the forces of indiscriminate development, and who can often, in fact, be the catalyzing force for preservation of their land.

How to Make Coordinated Acquisition and Protection Happen

There are opportunities for coordinated acquisition and protection at many different levels and geographic scales. You might want to "adopt" a specific piece of choice waterfront land in your neighborhood or elsewhere in your community, and help to secure public protection and recreation use for it. Or, you might want to work at a broader geographic scale, by developing and implementing a plan for waterfront parks in a larger area such as a whole town or county, or along a particular river or lake. On the other hand, rather than focusing on specific pieces of land, you might take part in a drive to redirect priorities at the state level, to ensure that recreation officials give adequate attention to emerging clean water opportunities when they disburse federal or state funds for land acquisition. Arguing persuasively for such a redirection of priorities requires a working knowledge of water cleanup programs, land possibilities, and the environmental, social, and economic advantages to be gained. Sometimes, until priorities are changed, specific acquisition objectives may be stalled.

The steps outlined below are the basic framework for bringing about coordinated acquisition and protection. Depending on your focus, you may want to emphasize some activities more than others; for example, if you are focusing on a statewide program, you might want to give more attention to land use analysis, and for this, may find information presented in the section on Greenways helpful. Even if you focus your efforts on acquisition of a specific parcel already identified undergoing analysis of alternative sites and developing criteria for rating areas may help you present a more persuasive case, and should not be overlooked.

Whichever scale you choose to focus on, there are a number of basic steps to undertake.

1) Determine the Schedule for Water Cleanup

- Find out the existing levels of water quality.
- Examine the state's "priority lists," which tells what communities will be receiving federal funds for municipal wastewater treatment facilities.
- Examine the provisions of National Pollutant Discharge Elimination System (NPDES) permits, and find out how well compliance and enforcement are proceeding.

Talk with "208" planning agencies, state and federal officials, and concerned environmental groups, to determine their perspective on clean water problems and progress, and find out when results can be expected.

- Put it all together, to determine when and where clean water will occur.

2) Survey Recreation and Open Space Opportunities Along Waterways

- Examine land use plans, zoning maps, recreation plans, and other maps and documents to see whether areas of prime recreational or scenic opportunities have been identified.
- Talk with recreation and planning officials, environmental and civic groups, and others to assess their feelings on which areas offer the greatest opportunities, and what criteria should be used in judging the desirability of properties.
- Survey the possible recreation and open space opportunities yourself to get firsthand knowledge of the different land areas and the opportunities that exist.
- Establish criteria for judging the desirability of potential recreation or open space areas, and develop priorities based on them. Possible criteria include such things as quality of natural features, proximity to population centers, potential for developing active recreation facilities, cultural or historical features, relationship to other actual or potential public lands (including, for example, potential for linear open space corridors, possibilities for park systems linked by trails, and the need for dispersing recreation lands throughout a community or region for both political considerations and the convenience of the public).

Waterfront trails were designed into the site of the Tallmans Island treatment plant in Queens, N.Y.

● Examine ownership, potential cost, and planned or likely uses for desirable open space and recreation lands.

3) Identify Available Programs for Land Preservation, and Determine Their Requirements and Policies

● Look into federal programs, as described in Chapter Three. Examine the Statewide Comprehensive Outdoor Recreation Plan (SCORP), by which federal funds are allocated. Talk with the State Liaison Officer, and find out how the dollar volume of applications compares with available funding.

● Find out if state programs for land acquisition exist, and if so, what their policies, requirements, and available funds are.

● Check into local land acquisition programs at the regional, county, city, and town level.

● Investigate the possibility of private donations of land or purchase money.

● Consider means of land preservation which do not involve actual purchase, such as conservation easements or tax policies. What are the laws and policies governing them in your state?

Historic sites along waterways, such as this New England grist mill, present acquisition opportunities.

4) Match Up the Timetable for Water Pollution Control, and the Opportunities for Open Space and Recreation Land

● Considering separate parcels, which pieces of land should receive priority given the immediacy of water quality improvement? What is the time frame for water cleanup in other waterfront areas?

● Considering the programs as a whole, where are recreation and open space programs out of phase with water cleanup schedules? Specifically, are land acquisition programs giving adequate attention to waterfront lands? Does the Statewide Comprehensive Outdoor Recreation Plan (SCORP) specify waterfront areas as a priority? Is the total amount of money available for land preservation enough? Are state and local governments able to raise enough money to take advantage of available federal matching grants?

5) Develop a Plan of Action

● Organize a constituency for coordinated acquisition and protection. Publicize the idea, and make its benefits known. Instigate public support for both specific waterfront parks, and for the concept as a whole. Make sure communities are aware of land opportunities and funding sources.

● Help adjust priorities in the Statewide Comprehensive Outdoor Recreation Plan (SCORP), if necessary, to reflect the importance of waterfront land acquisition.

● Work for greater funding of open space and recreation programs, especially where individual communities need to make a greater local commitment in order to take advantage of federal matching funds. If your state does not have a program to supplement the federal Land and Water Conservation Fund grants to communities, you may want to try to have one established.

● Become familiar with the political, legal, and administrative procedures necessary to take full advantage of existing programs. Know the deadlines and requirements, and the important decisionmakers. Think out the points at which demonstrated public support can be most effective and consider how best to demonstrate that support. Make sure to bear in mind the possibilities of action at the federal, state, and local levels.

● Monitor water quality progress to make sure it is proceeding on schedule. Give officials the support they need to insist on compliance with pollution standards. If necessary, help adjust water quality plans to ensure early cleanup near existing or planned recreation areas.

Problems You May Encounter

Chief among the problems you are likely to encounter is the perennial difficulty of scarce funds at the local level. In this era of municipal budget-cutting, acquisition of recreation land may seem a true luxury, something that can be easily postponed to a later date. Yet recreation and open space advocates are continuing to have success in many areas, through careful efforts to marshall support and publicize the need and value of parks and open space. The nature of low value soon-to-be cleaned waterfront land, combined with the lure of federal matching funds, makes acquisition *now* a considerable bargain for community funds, and this argument has been used effectively in countless cases.

Another difficulty may come from efforts to reorient priorities for the expenditure of state and federal matching funds. Proponents of waterfront acquisition may find themselves at odds with those who are arguing persuasively for other priorities—such as urban parks, or threatened natural areas. To a large extent, careful planning can help these interests to coincide. Yet

where legitimate disagreements over priorities remain, persuasive reasoning and demonstrated political and public support will be the key to success.

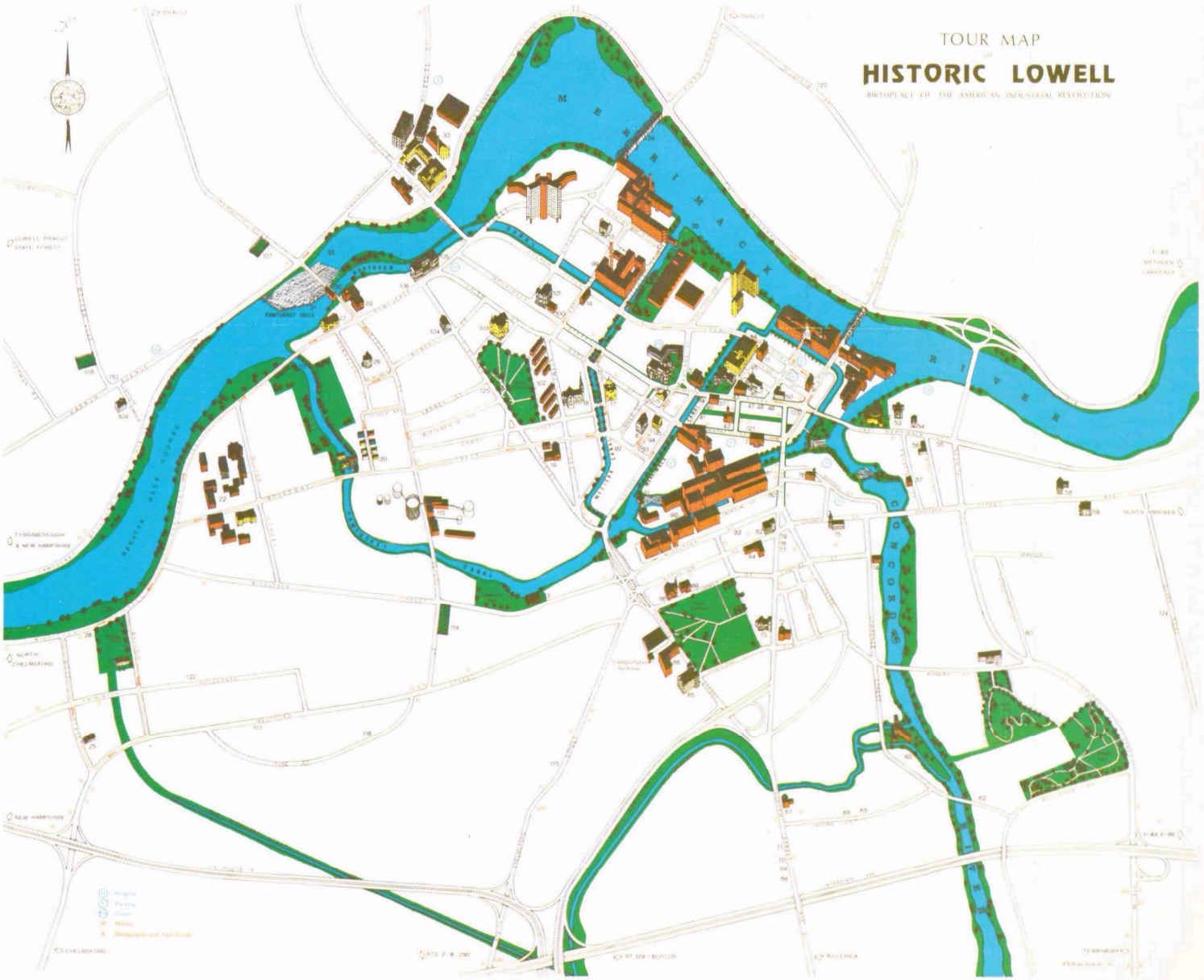
Other problems you may come across involve the process of acquiring specific parcels. Often the negotiations with landowners are delicate and time-consuming; sometimes land must be taken by the power of eminent domain, though this not only creates ill will, but often raises land costs as well. Sometimes, too, you will find that land begins to rise in value as soon as acquisition intentions become known, and thus the need for quick action becomes important. Finally, once land is acquired, there is the difficulty of ensuring adequate funds for the necessary but less inspiring task of maintaining the new parks and recreation areas.

Some Examples

One of the most intriguing examples of the coordinated acquisition and protection concept is taking place in Lowell, Massachusetts, an hour's trip north of Boston, and once a proud textile center of the 19th century world. The city had been a victim of declining industry and a deteriorating core, until it developed the concept of an "urban cultural park" as the centerpiece of its bid for new vitality and economic investment. The plan was designed to build anew on the city's original strengths—its location at the confluence of the Concord and Merrimack Rivers, its legacy of long, brick mill buildings, and the network of canals that thread through the city.

The urban cultural park is a many-faceted proposal combining

Water cleanup was indispensable to the Urban Cultural Park concept in Lowell, Massuchusetts centered about its historic canal system.



Section 201 of the Clean Water Act, which authorizes the construction program, originally directed that:

"The Administrator shall encourage waste treatment management which combines 'open space' and recreational considerations with such management."

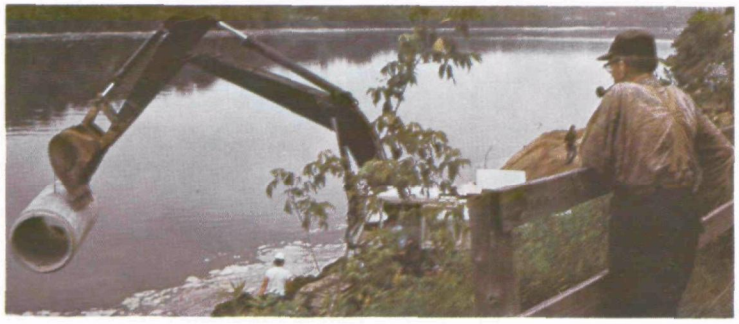
To ensure implementation, Congress amended Section 201(f) of the Act in 1977 to say:

"The Administrator shall not make grants . . . [for] treatment works unless the grant applicant has satisfactorily demonstrated to the Administrator that the applicant has analyzed the potential recreation and open space opportunities in the planning of the proposed treatment works."

Section 201 (g) (6)
Clean Water Act of 1977

creative reuse of historic architecture, exhibits of the industrial revolution, and extensive landscaping and recreational development. The city's waterways—both its rivers and its canals—have become a central focus for the revitalization effort. A vigorous cleanup program is underway, including federal and state funds to rehabilitate and restore the canals. There are plans to protect the undeveloped banks of the two rivers, and extensive landscaping and recreational development along the five miles of canals is also part of the effort. Hiking and biking trails are being designed to follow the same easements as wastewater collection systems. Lowell's strategic location offers it the potential of becoming an inland boating center.

The efforts of Lowell are typical of many communities across the country, large and small, which are rediscovering their waterfronts. In some cases, this means revitalizing rundown developed areas, as in Lowell. In other cases, it means protecting areas still unspoiled. For example, along the Miami River in Ohio, a regional open space and trail system is being developed in concert with water cleanup programs. Whatever the variation, there are already many communities proceeding toward a coordinated acquisition and protection program—and countless more where the potential awaits only the interest of citizens and officials to become a reality.



Interceptor construction (right) provides opportunities for multiple use such as a public trail (below).

The Concept

The objective of multiple use means getting extra value from a wastewater treatment plant or collection system by using it for recreational purposes in addition to its primary role of cleaning up pollution. Thus, the easements obtained for an underground wastewater collection system might also be written to allow for development of a walking and bicycle trail system—a natural idea, since collection systems tend to connect the points in a community between which most people want to travel. Or, a treatment plant, which often utilizes only a fraction of the land purchased for it, can be designed so that a boat launching ramp, or tennis courts, or a host of other recreation facilities can be accommodated within its site. In one innovative case in Evergreen, Colorado the roof of a treatment facility has been used to provide recreation space in a congested area. The potentials are as vast as the number of pollution control facilities being built across the country in the drive for clean water.

Why Is Multiple Use Desirable?

Multiple use stretches the public dollar in a variety of ways:

- When heavy equipment is already on site, it is much cheaper to build recreational facilities.
- Often, indeed, some kinds of recreation can be provided at no extra cost. For example, since the land has to be restored in some way after construction, a little planning can make sure that it is done in a way that will accommodate a recreational activity such as a playing field.
- Since easements must be negotiated anyway for the collection systems, it is often a simple matter to include provisions for a trail system at the same time. These trail systems, in addition to linking points throughout the community, can turn disjointed and fragmented parklands into cohesive recreation systems, making the whole more than the sum of the parts.
- The environs of a treatment plant constitute a waterfront access point which is already in public ownership, and thus a prime location for boat launching ramps, picnic areas, and other waterside uses. Particularly in areas where opportunity for waterfront access is restricted, these opportunities should not be overlooked.

Central to making multiple use an attractive idea is the realization that a treatment facility need not be ugly. As one engineer put it, "If you want us to, we can put curtains on the windows and make it look just like any house in town." Landscaping can provide further screening; and appropriate design of the plant and choice of equipment can keep noise levels and odors at a minimum.

The Major Actors

Perhaps the person most important to cashing in on multiple use opportunities is the *consulting engineer*. When a city or town needs to build a wastewater treatment plant, it hires a private engineering firm to first design and then construct the facility. An alert consultant may be the initiator of the efforts for multiple use, but at the very least, cooperation from the engineering firm is essential to success. The Environmental Protection Agency is engaged in a training program to alert consulting engineers to the concept of multiple use, and the benefits to them of incorporating recreation opportunities into their design—chief among which is greater public support when the time comes for the community to vote its share of necessary funds.

Of course, the enthusiasm of community recreation and conservation officials is critical, as is the support of the sewer commission or other community board charged with responsibility for waste treatment. Both groups of officials will have to cooperate in developing or approving plans and ensuring maintenance of the recreation areas. They are in an ideal position to initially raise the possibilities of multiple use. Approval by the mayor, board of supervisors, city or town council, or other elected officials may be necessary—particularly if local funds are to be used for developing the recreation area. Even if no formal approval is necessary, their support can be invaluable and their opposition formidable.

The Environmental Protection Agency assists multiple use efforts by providing funds for consulting engineers working on construction grants projects to:

- coordinate with public officials and citizens interested in or charged with responsibilities for recreation and water cleanup;
- develop multiple use proposals and study their feasibility;
- design and construct the wastewater treatment system to accommodate recreational uses, even if, in some cases, this leads to extra costs;
- design and carry out landscaping and regrading so as to promote recreational use.

The question of which costs EPA can justify to accommodate recreational uses in wastewater treatment projects has no definite answer, and currently is determined on a project-by-project basis. Generally, it must be kept in mind that the principal purpose of the project, from EPA's perspective, is to control pollution; thus, EPA funds cannot pay for purely recreational items, such as playground equipment, or for detailed recreation planning for the community. Less clear, however, would be a case in which a fence becomes necessary between a playground and treatment plant equipment. If the fence would not be necessary in a non-multiple-use area should it be paid for with recreation funds, or wastewater treatment funds?

Again, until policy evolves on this question, or until clarifications are made in laws or regulations, the question will be decided on the merits of each case. Magnitude of the cost is not even necessarily a defining criterion. In general, a good concept to bear in mind is that modifications to structures which are needed for the treatment process anyway will more readily gain approval than separate structures which must be built as a direct result of the multiple use idea. Remember, though, that there is a long history in federal construction projects—such as the Interstate Highway Program or the Corps of Engineers Flood Control Program—of creatively restoring sites not only to mitigate adverse construction impacts but to permit auxiliary public uses.

EPA is not, however, the primary source of funds for multiple use efforts. The Heritage Conservation Recreation Service can provide funds for development of recrea-

Clean water, innovative design and receptive officials provide a scenic view of Lake George in upstate New York from an observation platform at a pumping station.

tion facilities, on a 50% matching basis. State agencies play active roles in both wastewater treatment and recreation, and may also be a source of necessary funds. Remember, too, that state environmental agencies which contribute funds to the wastewater treatment project will also want a voice in approving multiple use ideas. Local agencies have budgets in both categories as well. Finally, the budgets of industries, foundations or other organizations located or doing business in your community ought not to be overlooked.

A key role in making sure that multiple use opportunities are taken can be played by civic groups, and indeed, individual citizens as well. Often, the initial push for multiple use comes from within the community, and citizens can also provide the sustaining drive when the press of everyday events makes an obstacle in the path of multiple use seem insurmountable to busy officials.

How To Bring About Multiple Use

Incorporating recreation opportunities into waste treatment projects is best done in the early phases of the planning "step" before engineering designs are approved or structures are begun to be built. If your community's project has already passed the planning step, however, there are still possibilities open; there may be opportunities to exploit which do not require any modifications in facility design, or it may still be possible to make minor changes. For example, even at the tail end of construction, it is possible to have regrading and planting done in a manner which permits the project site to be used as a recreational area.

Bear in mind that EPA funds wastewater treatment construction projects in three distinct phases or "steps." Step 1 is facility planning, in which the treatment needs of the community are examined, and alternatives developed around issues such as how large an area of the community should be sewered, what type of plant design and treatment process is best, what size plant is needed, preliminary design studies, and where the plant should be built. After public discussion, a "selected alternative" is chosen, the community votes its share of construction costs, and application made to the state and EPA for further funds. *Clearly, Step 1 is the most critical phase for identifying and incorporating multiple use opportunities.*

After EPA and the state approve the selected alternative, Step 2 funds are awarded, and the consulting engineers and architects undertake detailed design and engineering plans for the facility. The plans are again reviewed by EPA and the state, and if satisfactory, Step 3 funds awarded for construction. While multiple use ideas could indeed be introduced in these latter two steps, it obviously becomes increasingly difficult to justify changes in the project which adds engineering and architectural design costs as it proceeds along the path to completion.

The message is clearly to *start as soon as possible.* The steps to undertake are:

1. *Examine the possibilities*—Every community involved in a wastewater treatment construction project should ask its consulting engineer or architect to look into multiple use opportunities. But whatever your role, look around yourself, too—you may see possibilities where others don't.

2. *Develop plans and alternatives*—Once tentative directions have been identified, have the consulting engineer investigate their costs and feasibility, and develop various multiple use proposals for citizens and officials to consider. Remember that EPA construction grant funds can be justified to pay the consultant for this. Graphics and visuals can be very helpful in communicating the recreation concepts.

3. *Begin to line up funding* — Determine what portions EPA can fund; check with state recreation agencies about both state aid and federal Heritage Conservation and Recreation Service funds; see what could be provided by other local and state agencies; and check with industries and private organizations.

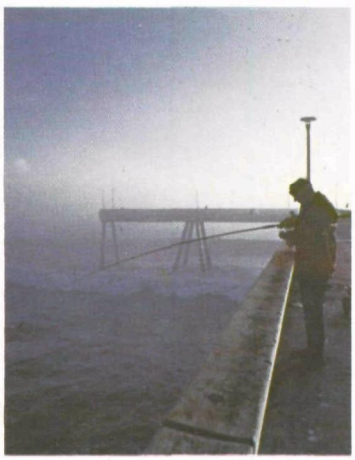
4. *Monitor the design of the treatment plant*—Make sure it is compatible with recreation goals, in terms of architecture, landscaping, screening, and noise and odor control.

5. *Publicize the possibilities, and gain support from citizens, professional and public interest groups, and government officials*—Even the best plans will go nowhere without official support. Informing the community is not only important in its own right but is also a way of galvanizing government action. The decision-making process (including a required public hearing) on waste treatment alternatives can provide a forum for deciding which multiple use opportunities to pursue.

6. *Finalize the funding, and develop agreements on who does what*—Nail down sources of funds, and make sure that all parties understand their responsibilities in the cooperative undertaking. It may be important, particularly with more complex projects, to develop a formal memorandum of cooperation between park and sewer officials to clarify items such as cost sharing, maintenance responsibilities, and liability.

Problems You May Encounter

The problems which crop up in multiple use efforts are those which can quite readily be expected in programs which involve fitting a new idea into established practices, particularly when doing so means coordinating the efforts of different levels and departments of government. There is still resistance on the part of some wastewater treatment engineers and public officials to the idea of incorporating recreational activities into treatment sites or facilities. They fear vandalism, or assert "that's not our purpose," and can considerably frustrate multiple use proponents.



An early multiple use project incorporating a fishing pier atop an outfall line in Pacifica, California.

Responses to this attitude can be found in the fact that Sections 201(g)(6) and 208(b)(2A) of the Clean Water Act specifically support use of recreation opportunities. Policies of the Environmental Protection Agency and the Heritage Conservation and Recreation Service thoroughly support the multiple use concept. Further, the variety of successful case studies, such as those at the end of this section, are concrete proof that multiple use works.

Another problem you may encounter is getting adequate funding. There may simply not be enough money available, in which case the only resort is to try more sources, or see if the recreation proposal can be modified so it is less expensive, or qualifies for monies that are available. A more frustrating funding problem is when recreation agencies and water cleanup agencies are on different funding timetables, and money becomes unavailable not because it isn't there, but simply because of conflicting accounting procedures or planning requirements of different federal and state funding agencies. The completion schedule for the water cleanup project may make it impossible for recreation officials to allocate funds in time for a joint effort. Sometimes, too, agencies squabble over who pays for what, and this can also be frustrating, especially in cases where the dollar amount may be relatively small but involves the principle of which agency has responsibility. Your recourse is to patiently negotiate, trying to work out a compromise or redesign the project to eliminate the obstacle. Or, another public or private entity might be persuaded to underwrite the disputed item.

A further sticking point that sometimes crops up is the question of liability, both for accidents which may occur to recreators, or for damage to treatment works. Laws vary, and it is best to get assistance from a knowledgeable attorney, or the community's legal counsel.

Some Examples

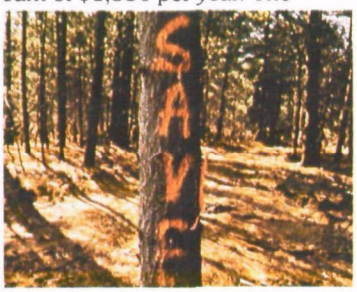
Across the country, cities, towns, and counties are making the extra effort to draw full value from public recreation and water quality dollars by using the multiple use idea. They are building trail networks, active recreation areas, community gardens, and pleasant parks by taking advantage of the three major areas for multiple use:

- the treatment facility itself;
- interceptors and other associated facilities;
- land surrounding the treatment facility.

The Treatment Facility Itself: An Example From Evergreen, Colorado

When Evergreen, Colorado—a community of 3,000 people about 15 miles southwest of Denver—had to expand its wastewater treatment plant, the chairman of the sanitation board conceived of a unique idea. An ardent tennis player, he had noted the lack of adequate court space in the community resulting from the soaring popularity of tennis, and the difficulty posed by the scarcity and high cost of suitable land.

Pointing out that a large area would have to be levelled at the expanded treatment plant for a "sludge digester," he proposed that two tennis courts be constructed on the roof of that facility. Adding another innovation, he further proposed that the project be a private enterprise effort, financed through membership in a "Sew'R Racquet Club." The Sanitation Board called for bids on rental of the roof space, and it was let for the sum of $1,350 per year. The contract was for 10 years, with a 90 day cancellation clause if the digester should ever need to be modified in any way (in which case the club would be reimbursed for its capital investments, minus depreciation).



Applying multiple use concepts helps to reinforce conservation and shoreland preservation principles.

Ten local families put up the funds and formed a non-profit club to build the courts. With total cost for construction only $12,000—versus an estimated $75,000 for two "normal" courts in the same community—dues in the club were kept down to $100 per year with a $250 initiation fee. All memberships were sold in short order.

The project has a number of benefits for all concerned. The Sanitation Board has incurred no costs, and indeed, receives annual rent payments. The community has two new tennis courts to take pressure off other facilities. And the club members not only enjoy inexpensive tennis but have an unexpected benefit from the 75 degree temperature of the digester below the courts—it dries wet spots and melts snow in the winter, allowing play to continue almost year round.

Manhattan's River Bank State Park:

A 30 acre park on the Hudson River in Manhattan is proposed for the roof of the North River Water Pollution Control Plant, and is perhaps the most imaginative example of the concept of multiple use. It is envisioned that the park might have picnic areas, tennis courts, a swimming pool, an ice-skating rink, walking and bicycle trails, and playing fields including three baseball diamonds—all on the roof of a million gallon per day treatment plant. The park is expected to accommodate 10,000 people a day. Since the project—including reinforcement of the roof and extensive landscaping—is very expensive, it is only justifiable in dense urban areas where large numbers can use it, and the lack of open land makes rooftop use practical. The HCRS and New York State and local governments joined together in the development of the overhead park.

Interceptors and Other Associated Facilities: Examples From Around the Country

The most often implemented type of multiple use involves wastewater collection systems and related facilities such as pumping stations. Perhaps this is because these facilities are scattered around the community, and thus are most accessible for recreation purposes—as the following examples attest:

- In Barrington, Rhode Island, due to strong public interest in the idea and a creative engineering consultant, a pumping station was located next to an outdoor ice hockey rink and designed to form bleachers for spectators.
- Residents of Pacifica, California, a few miles south of San Francisco, had long wanted an ocean fishing pier, but the city was not able to finance construction of the pier by itself. The solution came with the idea of finding a dual function for the pier so the city would only have to pay part of the cost. The pier was designed not only to serve as a recreation facility, but as support for a treated water outfall from a wastewater treatment plant. Financial assistance came from EPA because of the outfall pipe, and from the Bureau of Outdoor Recreation because of the fishing facilities. Since the outfall extends out half a mile into the sea, or twice as far as the pier, there is no danger of contamination of the fishing area. Over 55,000 people a year use the pier.
- The Washington Suburban Sanitary Commission serves the two suburban counties in Maryland which border the District of Columbia, and has a long history of working closely with recreation advocates. It has close ties with the Maryland-National Capital Park and Planning Commission, and has had an extensive public participation program for its wastewater treatment projects. Public concern directed attention to gaining the

maximum benefit from these construction projects by developing a trail network over interceptor lines. The Sanitary Commission and the Planning Commission have had, since 1974, a Joint Agency Recreation Committee, and as a result have already built a number of hiker-biker trails in conjunction with wastewater collection systems and have plans for more in the future. The same construction contractor handles both jobs, with the Planning Commission designing the trail and funding that phase of the activity. Public response to the program is enthusiastic, and both agencies have benefited from this support.

● In Bellevue, Washington, a suburb of Seattle, construction of an interceptor line through an undeveloped marshland known as Mercer Slough is being coordinated with recreation officials to provide a bicycle path through the property. The land is being purchased with the help of money from the federal Land and Water Conservation Fund to ensure its preservation, and the path will enable visitors to appreciate its scenic and ecologically interesting natural features.

● In Cook County, Illinois, the Metropolitan Sanitary District of Greater Chicago operates a system of canals for sanitary and shipping purposes. As the pollution in these canals is cleaned up, the sanitary district is realizing the emerging recreation potential. Already, an arboretum and ecology center have been built in Evanston, and various recreation facilities have been established on canal lands by the Chicago Park District.

Land Surrounding the Treatment Facility: Examples From Queens, New York and Naperville, Illinois

Extra land beyond what is needed for the treatment facility is often purchased at the time of construction. This may be to allow for future expansion; because of state or local policy of providing a buffer zone around the plant; or simply because an owner will not agree to subdivide a parcel. The following examples highlight one case in which a park has been built on land slated for future expansion of the facility, and another in which a permanent buffer zone has been used.

● At the Tallmans Island wastewater treatment plant in Queens, New York, project planners found it necessary to purchase more land than was immediately needed, in order to allow for future expansion of the plant. Rather than leaving the unused land vacant, however, a landscaped park was fashioned for the site, with excavation material left over from construction used to form berms in the park for visual screening and topographic variety. A pier, needed for the docking of sludge barges, has been opened for the use of fishermen as well. The innovative engineering firm for the project worked with the New York City Arts Commission on the design of the treatment facility, and with the Brooklyn Museum to preserve artifacts found on the site and erect them in the park as sculptures.

● Construction of a new regional waste treatment facility in Naperville, Illinois, resulted in a considerable plus for the area when buffer land around the treatment plant was leased to the Naperville Park District. Much of the land has been turned into community garden plots for residents joining the nationwide revival of "victory gardens," and a canoe launching area is also being constructed to give boaters access to the DuPage River which borders the site.

One of the most fully developed multiple-use programs in the country is located at the Springbrook treatment facility in Naperville, Ill. outside of Chicago. Shown are the community garden plots located on the site.

The Concept

As the nation makes its concerted push for fishable and swimmable waters, technical innovations and new standards and requirements are making many older treatment plants outdated. These facilities are being replaced with newer, more efficient plants, better able to contribute to clean water progress. Yet this is posing a problem in many communities, where abandoned plants can tie up desirable properties, or worse yet, become nuisances subject to vandalism, accidents, and other problems.

In a number of cities and towns, however, these problems are being avoided by creatively adapting outmoded treatment plants to recreational purpose. Old plants tend to be located in dense neighborhoods, or on prime waterfront land, which make them excellent candidates for rehabilitation into parks; and many of the existing structures can be converted to useful new purposes.

Why Is Recycling an Old Plant Desirable?

Recycling an abandoned treatment plant makes sense because it eliminates an eyesore and potential trouble spot, helps meet demand for recreational facilities, and converts otherwise wasted land and structures into new assets. By accomplishing these goals through using land already publicly owned, and adapting structures which are already in existence, it can achieve benefits for the taxpayers that are more than proportional to its costs.

The Major Actors

Perhaps the most essential person in an effort to recycle an abandoned wastewater treatment facility is an architect or other person who can visualize the opportunities presented by existing structures, and help others to see the transformations possible. Imaginative recreation officials who are willing to take on an unusual project are also important actors. A committed public can be the catalyzing force for bringing the project about, and civic or environmental groups can play a major role in sparking that public interest and commitment. Cooperation from the sewer commission or other local body charged with responsibility for the old plant can be very helpful, particularly if the new facility is to be built on the same plot and recreational designs must be kept compatible with it. Many people may be involved in funding the project, from private sources, to local park and recreation agencies, to state agencies, as well as the Heritage Conservation and Recreation Service.

How To Make Recycling Opportunities Happen

Developing an exciting plan and showing people the possibilities is an important key to success in a project of this sort, and thus you should make an effort to develop visual materials as soon as possible. The basic steps you will have to go through in implementing a recycling project are:

- develop plans for recreational designs;
- build a constituency for the recycling concept, and demonstrate public support for a park;
- develop cost estimates;
- explore funding sources;
- finalize plans based on public input and financial considerations;
- secure a sponsor for the project, such as the local recreation or parks agency, which can receive grants for development, and provide for maintenance;
- secure necessary funds;
- carry out reconstruction work;
- ensure adequate maintenance.

Problems You May Encounter

Problems which you might encounter are principally related to the novel nature of the recycling concept. Citizens and officials may at first be skeptical of the whole idea, and take considerable convincing. However, as more experience is gained across the country in the creative reuse of old buildings, and as more and more examples of successful conversion of abandoned treatment plants into parks and recreation areas can be pointed to, this problem should diminish. Of course, there will always be the problem of convincing officials to allocate limited funds to a project, but the economies of reusing land already owned and facilities already in existence offers a strong argument in favor of recycling projects.

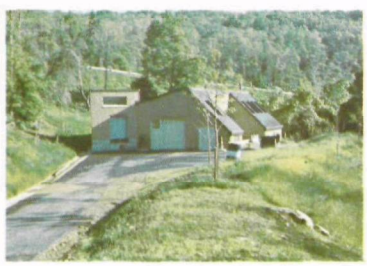
Some Examples

One of the best examples of creative reuse of a wastewater treatment plant can be found in Miamisburg, Ohio, a suburb of Dayton. The long-unused plant had become a neighborhood eyesore, and at the instigation of nearby residents, city officials began to consider what to do with it. A recreational use of the site seemed to make the most sense, since park facilities were badly needed in that part of the community. The city was able to obtain funds from the federal Land and Water Conservation Fund to develop what became an attractive new park.

Residents worked with park planners on the design, and the resulting Westover Park includes tennis, basketball, and volleyball courts built from the old sludge beds; a splash pool and roller skating area fashioned from the treatment plant's aero-clarifier; and an "adventure playground" developed over the former sludge digester. The administration building is used for restrooms and a storage area. Open land surrounding the treatment facility—originally set aside for its expansion— is used for a ball field and free play area.

Plans of a similar nature are currently underway for outdated treatment plants in San Antonio, Texas at a site along Cibelo Creek, and in Naperville, Illinois, where construction of a regional plant has led to abandonment of four facilities along the DuPage River.

The beginning of a playground emerges from a treatment plant made obsolete by a newer facility in Miamisburg, Ohio.



By careful planning and design—water quality improvement projects provide real life laboratories for a wide range of learning experiences and environmental education:

An outdoor classroom at the Baylands Interpretive Center, Palo Alto, California (top); a lecture room at the John E. Egan Reclamation Plant in Chicago, Ill. (upper center); a tour group at the treatment plant in New York City's 26th ward (lower center); and a yet to be blazed interpretive trail at the site of the Shenandoah National Park's newly constructed treatment facility for the Panorama Visitors Center on Skyline Drive near Stanley, Virginia (bottom).

The Concept

Most people enjoy finding out how things work, and thus for many years wastewater treatment plants around the country have been responding to requests from school groups and other sectors of the public seeking guided tours of plants and information about the treatment process. Now as communities across America come to grips with their wastewater problems—and with large numbers of people becoming interested in treatment processes and the effects of pollution on natural habitats—there is an increased demand for incorporating educational opportunities into wastewater treatment facility plans. There is also a growing feeling among water quality planners, wastewater treatment technicians, and environmental educators that public education must receive greater priority, so that unique opportunities for increasing public knowledge about water quality problems and solutions will not be lost.

There are a number of ways to provide for educational benefits at a wastewater treatment facility. Traditionally, education programs focused on making staff people available to lead groups on a tour of the plant, with appointments made in advance by interested community or school groups. As the number of such groups has increased, and the requests have come from school groups of younger and younger ages, it has become necessary to design plants to more easily and safely accommodate these tours. These innovations can range from relatively minor changes such as guard rails and glassed-in observation areas, to major design changes so that visitors can get greater insight into the actual working of machinery, and more clearly understand the steps involved in treatment.

A number of new treatment plants are going a step further, by providing less "programmed" types of educational opportunities. These typically involve "self-guided" tours such as are often found in museums and other exhibit areas, using colorful display panels to explain processes, and recorded explanations at various points along a path through the plant, which can be listened to by tour-takers as they pass through. The virtue of this type of educational design is that it allows large numbers of visitors to go through the plant at their own time and pace, in complete safety, without taking valuable staff time from the operation of the facility. And, of course, a "self-guided" tour can be supplemented with other more programmed activities for those groups which desire a more thorough explanation.

Oftentimes a careful selection and development of the treatment site itself can provide added and dramatic lessons of the relation between clean water and the local ecology. The land surrounding the plant can be planned as a natural wildlife sanctuary, and a highlight of the educational program.

Why Are Educational Opportunities At Treatment Plants Important?

Perhaps the greatest reason for taking advantage of educational opportunities at wastewater treatment plants is that doing so is an important step toward firmly establishing a water quality ethic in American society. Our current massive water pollution problem, which is being addressed through huge expenditures by federal, state, and local governments, as well as private interests, is due to our past misunderstandings of the dynamics of water quality, to the fundamentally wrong notion that we could dump raw wastes in rivers, lakes and seacoasts and they would simply be carried "away." There is no better way to drive home the point that our own wastes are what cause pollution, and that careful treatment of them is an absolute necessity, than to take school children and senior citizens, business people, homemakers, and politicians, and show them the impressive facilities necessary to safely dispose of municipal and industrial wastewater.

Similarly, the costs of constructing, operating, and maintaining these complicated treatment facilities represent a substantial public investment, and adequate public understanding of what these tax expenditures are paying for is desirable both from the point of view of civic responsibility, and from the point of view of maintaining public support for continued water pollution control efforts.

An educational program at a treatment plant can not only help inform citizen taxpayers, it can also stretch tax dollars by supplementing educational programs at community schools. The environment is an increasingly popular subject of study. In cities across the country—Palo Alto, Chicago, New York City, Washington, D.C.—schoolchildren by the busload are touring wastewater treatment plants as part of their environmental curriculum. For modest investments compared to the total cost of the treatment plant, these facilities can become valuable additions to classroom study.

An important result of public education efforts at wastewater treatment plants is that they are beginning to break down what many water quality experts call the "sewage stigma." Public education about how waste is treated helps overcome barriers to new and important resource management concepts such as using sludge for fertilizer or treated effluent as irrigation water. It also helps to increase the prestige of, and interest in, the jobs available in treatment plant operation.

The Major Actors

The engineering consultants designing the treatment facility are among the most important people to work with in making educational possibilities a reality. Without their understanding of possible techniques, their knowledge of the community's desires, and their

commitment to fulfilling educational needs, it will be difficult to bring about a treatment plant design that facilitates educational programs.

The sewer commission or other local body charged with overseeing the construction and operation of the plant is also extremely important, not only in its own right, but because of its ability to influence state and federal officials and the engineering consultants. Sewer boards are important not only in ensuring proper design of the facility, but also in making sure that, once it is built, an educational program is carried out. School officials can help provide a constituency for educational efforts, and their commitment is obviously necessary to integrate the educational opportunities at the treatment plant into school programs.

The commitment of local elected officials is important in making sure that there is the necessary financial support for any design modifications that must be made, and for whatever budget commitment must be made to running an educational program. Federal officials in the Environmental Protection Agency and state officials in relevant departments can help in providing expertise on how to make appropriate modifications to facilities to maximize educational potentials, and in providing plans and examples from other successful efforts.

Finally, of course, the demonstrated support of the public at large is the best way to convince officials of the necessity of an educational program, and the knowledge of that program's existence by the public a key ingredient for its success.

How To Bring About an Educational Program

A good place to begin implementing an educational program is with a survey of the obstacles and potentials at the treatment plant itself. If your community has an existing plant, you will have to determine what constraints exist because of its design or its facilities—for example, is there room to handle a large group going through without unduly disturbing operations? Are there safety questions for young schoolchildren? This leads, of course, to the question of what modifications can feasibly be made, such as adding guard rails, glassed in observation areas, or suspended walkways. And this, in turn, leads to a question of budget, not only for any necessary modifications, but also for staff time to conduct programs. Existing staff may be able to fit this into their schedule, or it may be preferable to hire someone specifically for this task. Or, need for staff time might be drastically reduced by building in a "self-guided" tour through the plant, with recordings, display panels, and other features. Where school groups are the prime targets of the program, perhaps one or more teachers could be trained as tour leaders.

If your community is still planning its wastewater facility, or in early construction phases, you may have more options open to you. Design elements are more flexible, and you may be able to incorporate imaginative ideas. You will have to work very closely with responsible officials and the engineer designing the facility.

The question of allocating staff time to educational programs may also be easier to resolve before patterns are established which exclude this duty. Or, it may be easier with a new plant, which is more in the public consciousness, to persuade officials to make a sufficient commitment to hire a full or part-time education specialist to design and conduct programs at the treatment plant.

Regardless of whether you are dealing with an existing treatment plant or a new one, it is important to consider how the program will be operated, and not to concentrate solely on bringing about its initiation. This is a matter of ensuring an audience for the program; ensuring sufficient commitment of staff and other resources at the facility; ensuring interest and knowledge on the part of school officials; and ensuring that the educational program is tailored to the needs of its users, and can flexibly adapt as these needs change.

Problems You May Encounter

The two principal problems you may encounter are treatment plant designs which are incompatible with an education program, and unwillingness on the part of officials to make a financial commitment to educational activities. These problems can often be related; a poor design which hampers education efforts may be correctable if funds to do so are made available.

It is easy to understand the reluctance of officials to strain municipal budgets in order to provide what may be considered a luxury, particularly since just the basic operation of the facility is often a major item in local budgets. Developing a strong base of citizen support for an education program is probably the best means of overcoming this reluctance.

If you are dealing with a new treatment facility still in the design stages, you may be able to take advantage of the fact that construction costs are borne primarily through federal and state grants to design educational features that, while more expensive to build in, cost less to maintain and operate. These would tend to be the "self-guided" tour arrangements which eliminate the need for additional personnel. Of course, you will need to negotiate with federal and state officials to determine what kinds of educational facilities they are willing to provide funds for.

Financial or facility design problems can sometimes be alleviated through a different approach to the educational program, and if you experience such difficulties it may be well worthwhile to examine what has been done in other communities. The examples below outline some possibilities.

Some Examples

In the Maryland suburbs of Washington, D.C., the Washington Suburban Sanitary Commission makes a concerted effort to open its facilities for tours by school and community groups. It has an arrangement with the public school systems in its service areas—in effect for the last twenty years—whereby it pays the bus transportation costs to bring school classes in to learn about the facility. This open-door policy has been met with enthusiasm from school officials; so much, in fact, that in the early seventies the demands on staff time caused by the tour program became impossible. Rather than cutting back, however, the Commission developed an innovative solution: it trained interested citizens in the basics of plant operation, showed them how to conduct tours, and then turned the program over to these part-time guides. The civic activists, retired people, former teachers, and others who participate are *not* volunteers, but rather are paid for their time and transportation costs. This provides a commitment and continuity for the program, but still keeps costs far below what they would be to pay engineers and other professional staff to conduct the tours.

A completely different approach to eliminating staff burdens from an educational program is being used at a wastewater treatment facility at Shenandoah National Park in Virginia. The plant is designed to provide park visitors with an overview of wastewater treatment, without requiring tour guides or forcing visitors to go on a fixed schedule. A series of signs along the roadway leading to the facility are used to begin the introduction; once inside, there is an elevated pathway which takes people through the plant, with visually appealing displays (complete with cartoon characters for children) which explain what is going on at various stages of treatment. There are also displays with recorded explanations which can be turned on by the push of a button. As visitors leave the plant, they exit into a landscaped area, complete with a waterfall and a goldfish pond filled by the plant's treated effluent, and more displays which explain the role of water in the environment.

Although the Shenandoah plant may seem an ambitious undertaking, many communities are opting for even more sophisticated environmental education programs. In Franklin, Ohio, for example, a regional entity known as

the Miami Conservancy District is establishing an Environmental Awareness Center on a 230-acre site on the Great Miami River. There is a large municipal wastewater treatment plant on the site, as well as a solid waste disposal facility and a plant for treating industrial wastes. In addition to regular tours, the District intends to renovate an existing building into an interpretative center, develop an "ecology park" with horticultural test plots to demonstrate the effectiveness of sludge as a fertilizer, and construct a trail system through the 230 acre property. A "Teacher's Guide to Current Environmental problems," prepared by District staff, helps teachers to make the most of educational opportunities available at the facility, and shows how to integrate use of the Center into classroom activities.

One joint development possibility is to create a community trail system by linking up interceptor R's-O-W with abandoned railroad lines.

The Concept

The objective of joint development involves the application of the principles of multiple-use to other kinds of projects surrounding the waste treatment facility—or close enough to it to make it a reasonable objective. An example might be the joint use of a sewer right-of-way and a railroad or highway right-of-way to develop a continuous trail system. This jointly developed trail system could even link up several existing parks. The flexibility of the joint-development concept is limited only by your imagination for relating what may first appear unrelated project proposals to achieve your recreation objectives. Joint-development projects of yours should not overlook embracing private developments, so long as a public recreation objective can also be served.

Joint development projects are ways of gaining experience in working with numerous and diverse interests. They provide, in miniature, the complexity of problems and opportunities that would be experienced in undertaking an entire long range "greenway" or "streambelt" project described in the following section.

Why Is Joint Development Desirable?

Joint development is particularly desirable where land—especially waterfront land—is scarce, either because existing ownership or development patterns preclude recreational land acquisition, or because recreation agencies have limited budgets. In these situations, joint development of a park sparked by the wastewater treatment facility but involving as many owners adjoining land as possible can be a good bargain for the recreation agency. Joint development is also an especially good concept in water short areas, where the presence of the wastewater facility provides an opportunity to use the purified water for an artificial lake whose recreational potential can be developed by private interests.

The Major Actors

The important "doers" in a joint development project are essentially the same as those in a multiple use effort. In particular, however, the "208" water quality planning agencies play an important role to help identify potentials. Federal, state, and local recreation agencies also play a more critical part, as they must provide more leadership in coordinating planning, design, construction, and financing of projects through state or areawide water quality planning processes.

How To Bring about Joint Development

The steps in bringing about joint development are similar to those in multiple use, except that again, of course, the recreation agencies must play a much larger role. Designs for all phases of the project will have to be jointly established and jointly approved by all land owners involved; therefore, enlightened agency leadership becomes especially critical. And it becomes even more essential in a joint development effort for planning and cooperation to begin at the earliest phases of the project, before opportunities are foreclosed or unilateral decisions made. The "lead time" for the project may become longer due to the necessity for incorporating the planning and approval processes of both recreation and water quality agencies, and the need for carefully negotiating necessary modifications to each agency's customary way of carrying out its activities.

Problems You May Encounter

Although it is far more complex, a joint development project may, in some ways, encounter few insurmountable problems, since it is likely to be attempted only where recreation and water quality interests are ready and willing to cooperate, and where the necessary spur to doing so, in terms of unique opportunities afforded by the project circumstances, is present.

Additionally, although the problems which could possibly be encountered during the project are similar to those in a multiple use situation, the level of cooperative effort inherent in joint development will necessitate sitting down and working out agreements on responsibilities *beforehand.* A clear understanding of planning, design, financing, construction, and management responsibilities, worked out before the project begins, written down, and clearly understood and agreed to by all parties, will help in smoothly resolving difficulties which may occur in the course of project implementation.

Some Examples

Yellowstone Canyon Lakes Project:

This project in Lubbock, Texas is not only an exciting example of joint development, it is also one of the largest urban park developments in the country. When completed, it will boast 1,350 acres of parkland, six-and-a-half miles of lakes, and twenty miles of trails. There will be opportunities for sailing, canoeing, fishing, tennis, volleyball, picnicking, bird watching, jogging, hiking, biking, and archeological exploration. What makes such a project possible in an area chronically short on water? The answer of course—intelligent reuse of treated wastewater, and in this case, not once but twice.

The project has its roots back in the thirties, when cropland near Lubbock's treatment plant began to be irrigated with wastewater effluent. One particular farmer contracted for the effluent, spreading it at a rate of one to one-and-a-half million gallons per day on 200 acre sections of his farm. By the mid-seventies, he had not only

gained considerable profit from his combination irrigation and fertilization efforts, but the city began to realize it had a considerable resource in the water table that had been built up through the percolation of wastewater through the "natural filter" of his farm's soil.

The availability of this water to create recreational lakes became the galvanizing force for establishing the ambitious Yellowstone Canyon Lakes park, literally created on the wreckage of a former dumping ground. The water will meet standards for "secondary contact" recreation such as boating, and it is expected that as water cleanup efforts proceed, the water will become usable for swimming as well. The land for the park is being acquired with the assistance of the Heritage Conservation and Recreation Service and the Department of Housing and Urban Development.

Castroville Regional Park: This well-established park on the banks of the Medina River in Texas has been open since 1974, and was in fact Texas' first regional park. One of the early joint development efforts, it began as a simple proposal to build a treatment plant and was turned into a joint park project through the efforts of one dedicated citizen. The owner of one of the candidate sites for the plant proposed that not just the 10 acres needed for the plant be purchased, but his entire plot of 126 acres. The remainder of his beautifully wooded property, he suggested, should be preserved as a park; so dedicated was he to this concept that he offered his land at a bargain rate and even volunteered to finance the mortgage himself at low interest and no collateral.

Unable to refuse such a generous offer, branches of federal, state, regional, and local government joined with private citizens, civic groups, and a local bank to bring the project to reality. The treatment plant was designed and built to fit unobtrusively into the park, and the Chamber of Commerce and the City Council cooperated in assessing the recreational desires of the area residents as the criteria for park design. Since its opening, the park has successfully operated on a fee basis to help offset maintenance costs.

Up to this point, the advice, information and examples presented, focused on projects which could be carried through completion by a civic effort in a relatively short period of years. The approaches which were discussed pointed out the different kinds of opportunities associated with each that you should be on the lookout to obtain the maximum community-wide recreational benefit from the public tax investments being made in the federal clean water program. Each one of the opportunities outlined could be undertaken separately by different citizen groups if need be to spread around the work and responsibilities for follow-through.

However, if indeed your community does have several of the kinds of opportunities described thus far, scattered throughout the community or along a common shorefront, there ought to be one group concerned with, and overseeing, the development of a *master policy* or *plan—for what you may have developing is what this brochure terms—the "Greenway Concept."* This is a long term commitment and can be greatly facilitated by working within the "208" state or areawide water quality management process.

The Concept

Establishing a greenway is the most comprehensive way to take advantage of clean water opportunities, and can bring together multiple use, joint development, recycling and environmental education opportunities using a highly coordinated acquisition, conservation and shoreland protection possibilities. A greenway is, ideally, a continuous belt of open space along a waterway, with a network of trails, and occasional parks for recreation. From this model, however, many variations are possible. For example:

- All or part of the potential greenway may be in already developed urban or suburban areas, making it necessary to limit the greenway in some portions to the width of a trail, or even to a series of interrelated but separate miniparks. Although many greenway projects establish a goal for the minimum width of the open belt along the river, a greenway does not have to be a uniform or arbitrary width, but can vary to suit specific needs and circumstances.
- Due to funding constraints, the preferences of landowners, or a desire to hold public maintenance responsibilities to a minimum, easements or land use restrictions may be substituted for outright public ownership of all or part of the greenway.
- Sometimes it may be necessary or desirable—particularly in urban areas—for parts of the greenway to be developed for commercial, industrial, or other uses rather than having the entire length in undeveloped open space. This may be simply a reflection of the existing character of the waterfront which cannot be easily changed; or it may be a conscious effort to include commercial development to provide a variety of uses—and indeed, to attract a different type of person to the riverfront. Properly sited, joint development possibilities incorporating well-designed commercial and industrial facilities *can* fit into the greenway concept.

Why Are Greenways Desirable?

The first and most obvious benefit of a greenway is that it provides a large, high quality, and easily accessible area for recreation. Greenways also:

- improve environmental quality by providing a buffer which filters and adsorbs pollution such as air pollution and urban or agricultural runoff before it reaches the water;
- provide valuable wildlife habitats and aquatic spawning grounds;
- reduce potential damage from flooding by keeping development off the riverbanks;
- reduce erosion of land and siltation of water by keeping the riverbanks under vegetative cover;
- provide aesthetic pleasures even for those who do not use the greenway directly for recreation.
- establish setbacks for some types of intensive urban uses as an aid in preventing the repollution of water.

The Major Actors

A greenway is an ambitious undertaking, almost by definition covering a large area of land and often extending over more than one political jurisdiction. Therefore, coordinated efforts by public and private groups on the local, regional, state, and federal levels can be important to success. Among the groups which might become involved in a greenway project are:

- watershed associations, which can organize the regional citizen constituency for the greenway;
- city, town, and county park and recreation agencies, which can provide local financial support, as well as land management and planning capabilities;
- city, town, and county planning boards, which can support the greenway concept through master plans and zoning decisions;
- Mayors, city councillors, selectmen, boards of supervisors, and other local elected officials who can seek federal and state funding, appropriate local shares, and generally support and promote the greenway concept;
- local and regional civic groups, including chambers of commerce, environmental and recreation groups, and community service organizations, who can provide the grass-roots support for the greenway;
- private landowners, including individuals and businesses, who can sell, donate, or give easements on their waterfront property, often in exchange for tax benefits;
- river and port authorities, who already have waterfront land under their control;
- 208 water quality planning and management agencies, which can provide perspective on water quality benefits of the greenway, and furnish a regional constituency;
- state planning, environmental, and recreation agencies, which can offer financial, political, and planning support to the project;

● state legislatures, which can appropriate funds for greenway acquisition, and also in some cases provide substantial impetus for the project through special legislation;
● federal agencies such as the Heritage Conservation and Recreation Service which can supply funds for greenway acquisition, and the Environmental Protection Agency, which can support the greenway through its water quality programs.

Any one of these groups might be the guiding force for the greenway project. Then, too, the greenway idea may be initiated by one group, and then picked up and implemented by another.

How To Establish a Greenway

There are five basic steps in establishing a greenway:

1) Collecting Information—There is much that you will need to find out before you can even begin to design and implement a greenway. First, of course, you need to find out the cleanup schedule for the river or lake around which you want to form the greenway. What water cleanup problems are being encountered? When will the water be clean enough for fishing and swimming? How is land use in the area related to water quality? In what ways can the greenway help improve water quality?

Next, you need to inventory the characteristics of the land which is the potential greenway. Who owns the various pieces of property? What are their intentions for using the land? Is any land already in public ownership? How much of the land is already developed, and for what uses? What are the natural features of the various pieces of land, including topography, vegetation, geologic features, presence of wildlife, soil characteristics, and so on? What is the range of land values in the area?

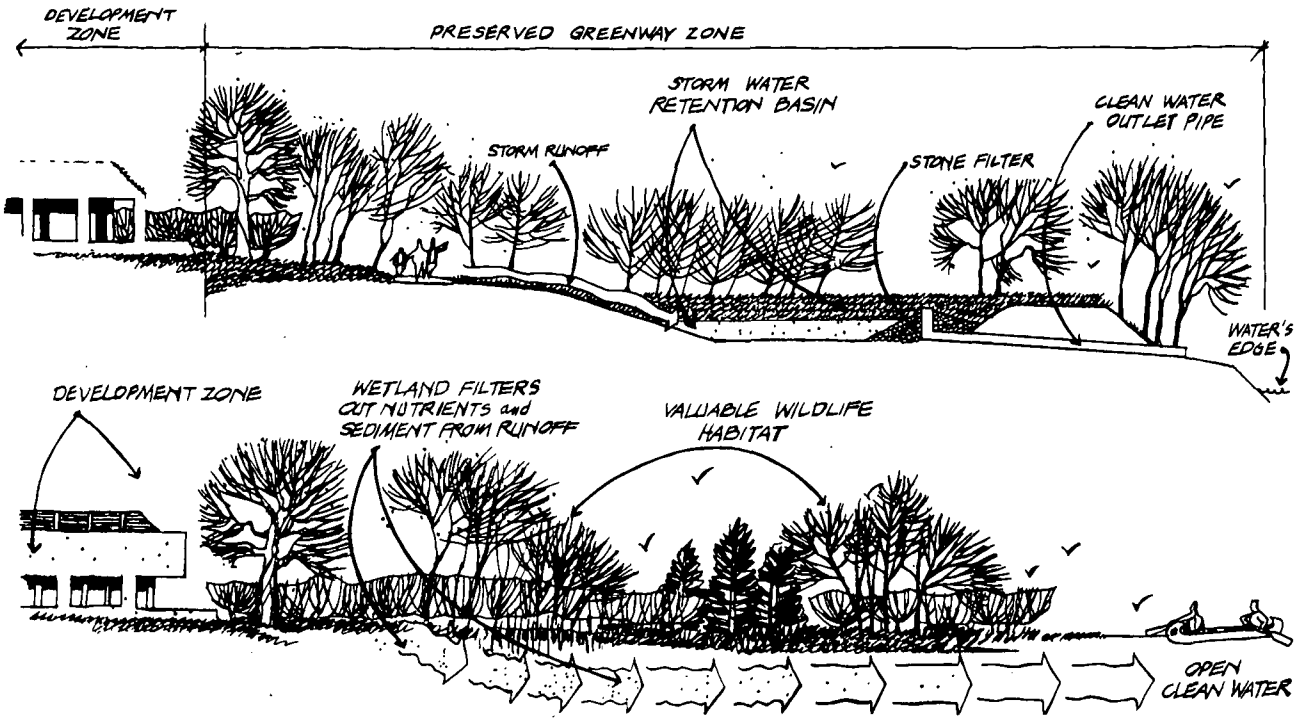
Then, you need to find out something about growth patterns and land use in the area. Is the population growing, and if so, how fast? How adequate are currently owned public recreation areas for the current population, and for projected increases? Where in the region is growth likely to occur? What are the existing land use and zoning plans of the various units of government in the greenway area, and are they in accord with the concept of a greenway?

Finally, you need to find out about the land purchase or preservation devices available in the greenway area.

Throughout the country, the Heritage Conservation and Recreation Service can provide funds for acquisition and development of recreation land. Many states have similar programs—does yours? The Nature Conservancy, a nationwide private group, can loan money to governments to buy open space; again there are similar organizations in many states. What opportunities exist in your area for loans or grants from private organizations? Many counties or individual communities have open space acquisition funds—do any of the governmental units within the greenway area have such funds?

In many states, it is possible to buy or receive gifts of easements which place restrictions on the use of the land, even though the original owner retains title to it. Thus, for example, rather than buying land outright, it might be possible to obtain an easement which will guarantee that the land will remain undeveloped. Easements carry the force of law; they can in many cases be obtained "in perpetuity" so that future owners will be bound by the same conditions; and they can, in many cases, allow for public access as well as preservation of land. What are the laws relating to easements in the state(s) in which the greenway is located? What tax advantages can a landowner gain in your state by donating an easement?

Some of this information will be available in community master plans, if they exist. Some can be obtained from government recreation and environmental quality



Greenways provide space for controlling future polluting of water from adjacent land uses as well as public access to water and shoreland recreation opportunities.

agencies at the federal, state, and local level. Some can be obtained by visiting the various properties and talking with landowners. Some can be obtained from knowledgeable citizen groups in the area. But, expect to do some digging—and a lot of work—to find out what you need to know.

2) Analysis—Once you have collected your information, you need to organize it and draw out useful patterns and conclusions. In particular, you should try to determine specific greenway needs, and the opportunities and constraints you may encounter. Some questions to consider are:

- Can the greenway be divided into urban, suburban, and rural zones? What are the characteristics of the different areas, in terms of existing riverfront development, amount of open land, pressure for development, quality of natural or scenic characteristics, potential for different uses within the greenway, cost of land, and other relevant factors?
- Where are the areas of special scenic quality and natural beauty? Where are the areas of historic interest? Where are the areas of unique or fragile ecosystems?
- What and where are the water quality problems on the river or lake? Where is water quality particularly good?
- What is the range of uses and activities possible in the greenway, given the natural characteristics of the land and the development already present?
- Where are the places which could become larger parks within the greenway, with suitable sites for development of "active recreation" facilities such as ball fields?
- How do existing land use and zoning plans relate to the greenway? Are they compatible with the concept, or will they need to be revised for the greenway to be successful?
- What problems or opportunities are created by growth and development patterns? What parts of the greenway area are subject to development pressure? Is there a recognized need in the region to provide more recreation and open space areas?
- What are possible strategies for purchasing or otherwise preserving the greenway, in terms of funding sources, choice of an agency or group to manage the land, and mobilization of public and governmental support?
- How can local and state tax assessment policies be amended to give incentives to private landowners to donate conservation easements?

Some of these questions are difficult to address, and involve weighing a variety of factors. This step might be the appropriate time to seek the involvement in the greenway project of those who have been trained in planning and landscape design, if they are not already part of your group.

Methods for organizing this information range from simple mapping and verbal descriptions to computer analysis. One particularly useful technique is overlay mapping, in which various characteristics of the area are mapped on separate transparent sheets. Overlaying the sheets in various combinations allows you to see where the characteristics overlap—for example, where areas of particular ecological importance coincide with areas of strong development pressure. This technique points out problem areas, and areas of mutually reinforcing benefits.

3) Greenway Design—Armed with the appropriate information and analysis, you can begin to design the greenway. Again, this might be the appropriate place to seek the help of planners and landscape architects, if you have not already.

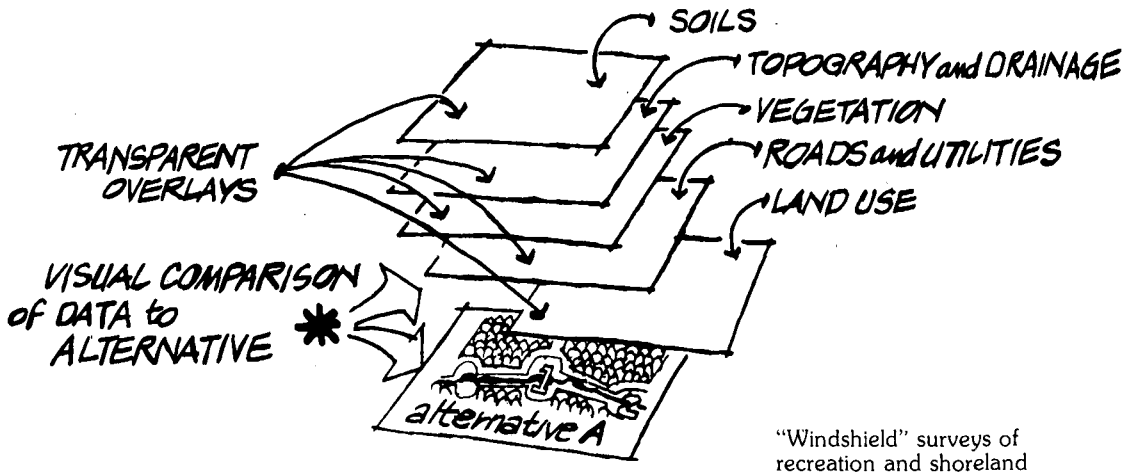
It is important to develop a series of alternative greenway plans, and to review both the options and your decisions periodically. Alternative plans are excellent vehicles for engaging officials and citizens in discussion of the greenway; they allow you to choose the most practical and desirable design; and they allow you to adapt more easily to changing circumstances over the years in which the greenway will be implemented.

The alternate plans you develop may differ in terms of

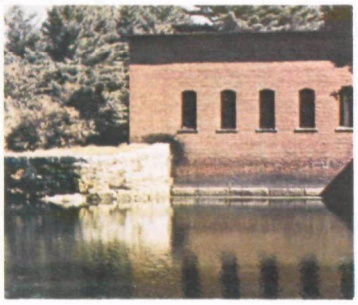
- *dimensions of the greenway corridor:* How wide is it? Where is it narrower or wider? What length of the river or lake is included in the greenway?
- *inclusion of larger parks dotted along the greenway;*
- *amount of land purchased versus amount preserved through easements;*
- *sources of funds;*
- *management agency:* Will the land be owned and maintained by a private group? By local governments? A county or regional government? The state government? A combination?
- *the types of uses provided for:* Are there places for active recreation such as sports and games? Is there a network of trails, and how large is it? Are there any commercial areas included? Are there facilities for boat launchings? If portions of the greenway have been preserved through easements, is public access provided for? Where is swimming provided?
- *how the greenway responds to various types of land and land uses found within it:* How are ecologically fragile areas preserved? How does the greenway deal with urbanized areas? With suburban areas? With rural areas? How does it deal with industrial and commercial development?

Various ways of responding to these issues are illustrated at the end of this section.

Once you have developed alternatives and sought public dialogue on them, you must determine a realistic set of projects to pursue to obtain your greenway objective. Obviously, the principal factors which must be balanced are the size of the greenway versus the funds and legal mechanisms available to obtain it. The best plan will be small enough to be workable, but large enough to capture people's imagination.



"Windshield" surveys of recreation and shoreland protection opportunities can be quickly hand drawn on transparent paper to overlay other mapped data including alternative treatment facility sites.



The Nashua River Greenway—a birds-eye view of the "resource" (top); shorefront which was permanently protected from development as mitigation for construction of a highway nearby (center); and Mine Falls State Park several miles from Nashua, N.H. was linked by a trail over an interceptor right-of-way to the center of the town.

4) Getting Public and Governmental Support—Obtaining widespread support for the greenway among the general public, government agencies, and elected officials is a prerequisite for success, and will not happen unless you consciously work for it. Widespread involvement in planning for, designing, and implementing the greenway should begin early in the project, and be as productive and meaningful as you can make it. You may have to alter your own concepts of the greenway, you may have to expend considerable time and energy to obtain public and governmental enthusiasm—but without it, you cannot succeed.

A key place for widespread involvement of citizens and officials is in evaluating and choosing between the alternative greenway designs which you develop. This is probably the phase at which public involvement on a large scale will occur, since it presents tangible choices for people to make. This is not to say, however, that citizens and officials should not be involved earlier in gathering and analyzing information and in working out the alternatives, but rather that enthusiasm for the greenway will grow when you can show people what you have in mind. For this reason, adequate attention to having appealing and informative photos and other graphics is important in presenting your alternatives.

To publicize your alternative plans, you should consider means such as:

- holding informal public meetings in affected communities;
- having a government body such as a park agency hold more formal hearings;
- obtaining newspaper, magazine, radio, and television coverage;
- preparing and circulating brochures,maps, and other printed materials;
- developing a network of people to spread the greenway idea through planned but informal "word of mouth" methods;
- making presentations in schools and at meetings of community organizations.

You must be sincere about public involvement, and be prepared to modify your plans according to the information and opinions you receive—otherwise, you will simply lose support as people become frustrated. You must also, if necessary, be prepared to explore new alternatives which surface in the course of public review.

5) Securing the Land—This is typically the longest phase of a greenway project, and can go on for many years. It is the stage at which it is vital to have a variety of people and organizations who can sustain a long-term commitment.

Much of the work in securing land for the greenway—whether by easement or outright purchase—involves careful and diplomatic negotiations with landowners. If you are working with a public agency, there is the legal option of taking the land by eminent domain—but it is simpler, smoother, and often cheaper to reach voluntary agreements with landowners.

Drawing from a wide variety of funding sources for purchase money is desirable because it involves more interests in the greenway, and can speed up the flow of funds as well as increase the amount. Remember the various programs described in Chapter Three and any state and local programs which you may have uncovered in your research.

In addition to land acquisition, you need to work to make sure that responsible park agencies have adequate budgets to maintain the land where this is necessary. Also, funds must be obtained for any structural improvements desired in the greenway—hiking trails, boat launching ramps, active recreation areas, landscaping or street furniture in more developed areas, etc.

Problems You May Encounter

The problems you may encounter in trying to establish a greenway are, quite frankly, both many and large. They are, however, surmountable—as the sampling of sucessful cases on the following pages attest. And though the problems encountered along the way may be large, the personal rewards and public benefits of a successful greenway are also large.

Problems which can occur in a greenway project are often due to:

- uncooperative landowners,
- lack of funds for acquisition,
- increasing land costs as public attention is focused on waterfront areas,
- the long time-frame of the project, and the need for a strong, long-range commitment from participants,
- keeping ahead of development in areas which are undergoing strong growth pressure,
- lack of interest from officials or citizens,
- finding funds to manage and maintain land once it is in the greenway.

Many of these problems are solvable simply by persistence. If landowners, officials, or citizens are skeptical about the greenway, step up your efforts at getting across the concept and its benefits. If one source of funds doesn't work, try another. Simply demonstrating that the greenway promoters cannot be deterred can eliminate many difficulties.

Some Examples

The Nashua River

The Nashua River Greenway demonstrates the key role which can be played by a citizen's watershed association, and illustrates the patience necessary to put together a greenway.

One of the pioneering greenway efforts, the Nashua River Greenway was first envisioned in 1969. Members of the Nashua River Cleanup Committee had been working for a number of years to improve water quality in the grossly polluted river, which suffered the

assaults of paper mills and other industrial and household polluters in its 56 mile course through central Massachusetts and New Hampshire. Finally, committee members were beginnig to see success, and were far-sighted enough to see as well the need to preserve open space while riverfront land was still low in value.

The Cleanup Committee evolved into the Nashua River Watershed Association, in order to address the larger issue of land preservation along the river. The Association began an effort to establish a continuous belt of open space, a minimum of 300 feet wide, along both banks of the Nashua and its major tributaries. Today, over 1,000 of the approximately 4,300 acres within the greenway have been protected from development, and having learned much along the way, the Association is confident of achieving its goal.

Residents of the watershed are beginning to see the greenway not only as a major recreational resource for the region, but also as a means of ensuring water quality in the River by precluding incompatible uses, of preventing erosion by keeping the riverbanks under vegetative cover, and of decreasing the need for expensive flood control measures by keeping the flood plain in its natural state. Additionally, the 56-mile ribbon of open fields, forests, floodplains, and marsh lands will provide a rich diversity of wildlife habitats, and major aesthetic benefits for the many cities and towns through which it passes.

But bringing about this public understanding of the benefits of a greenway has not been simple. The Association began in 1969 by undertaking a hydrologic study—with the help of a volunteer—to determine ground water supplies, and the extent of wetlands and flood plains on the Nashua. With the help of the 15 communities along the river, it then put together "A Preliminary Regional Plan for the Nashua River Greenway," a town-by-town analysis of riverfront land in terms of the proposed Greenway.

Cities and towns were urged to earmark their properties for preservation, and to act as a regional group in seeking federal and state aid for land acquisition. The town conservation commissions began to form greenway subcommittees, although many officials still questioned the logic of spending scarce funds to preserve land along a dirty river. In some areas, the color of the water still depended on what color of paper the local mill was making that day.

Very early in the greenway efforts, the Watershed Association identified priorities for acquisition. These were based on factors such as the quality of the area in scenic and ecological terms, accessibility to the public, feasibility of acquisition, and the important consideration that each of the communities in the corridor should have at least one area of protected open space so that they could begin to enjoy the benefits of the greenway.

The Association also worked at other means of land preservation besides outright acquisition. It drew up a model floodplain zoning ordinance, and distributed it to towns in the watershed. Of the fifteen towns, six adopted the ordinance into their zoning by-laws.

Further, to deal with the question of land use throughout the region, the Association published "A Plan for the Nashua River Watershed," which urged compact town development with preservation of undeveloped riverfront, and revitalization of blighted waterfront areas in the region's urban centers.

In these developed urban areas, where a continuous wide belt is not possible, the greenway plan envisions a system of mini-parks connected by bicycle or foot paths. The public would thereby be provided access to the cleaned-up river, without disturbing, or being disturbed by, existing commercial or industrial development.

During the Water Cleanup and the Land Conference in 1975, participants visited one such park to see first-hand what can be accomplished in an already developed area. Mine Falls Park in Nashua, New Hampshire, although a three-mile long strip of land sandwiched between a housing development, a shopping center, and factory buildings, nevertheless boasts an oasis of forests, a canal, and a handsome lock house bordering the river. The conferees met with the engineer who was designing a network of bicycle paths for the park and adjacent high school, as well as ballfields on a covered-over sewage lagoon which is no longer being used.

A few miles away, the factory town of Fitchburg, Massachusetts is making its new Riverside Park a key element in its plan to bring new life to the community. The state seeks to make a five-acre park a model in the campaign for urban revitalization and made funding for it the top priority for state and federal assistance. Industry is landscaping riverfront properties and donating easements.

How Land Is Acquired

Although most cases of public acquisition involve purchase by a city or town with assistance from federal and/or state open space funds, many other sources of funds have been tapped to preserve land in the greenway. Mine Falls Park, for example, was acquired with the help of a philanthropic industrialist in the community, with matching funds supplied by the federal Bureau of Outdoor Recreation. Sometimes, landowners have been persuaded to donate rather than sell their land or an easement on it. The donations have been to a variety of organizations—the town conservation commission, a state agency, national or state private land trusts, or often, a local land trust established by property owners to keep control of the land comfortably close to home.

Sometimes, too, preservation has been accomplished through wholly federal action, such as in the case of the Oxbow National Wildlife Refuge. In another example, Fort Devens has agreed to keep its large riverfront acreage in a natural state (and also supports the greenway by offering the Watershed Association office space and staff assistance at the Fort, because, as its commanding officer says, "we have a vested interest in the river, too.")

In one case, the Division of Fisheries and Wildlife in Massachusetts had been very interested in a high quality 450 acre tract of land, but when it came up for sale, did not have funds available to meet the purchase price. The Watershed Association contacted the Nature Conservancy, which agreed to purchase the land and hold it until the state could obtain adequate funds.

Another way in which land has been publicly acquired is through tax title—that is, when a city or town accepts ownership of a piece of land in lieu of back property taxes which the owner cannot pay.

The Role of the Watershed Association

In the case of the Nashua River Greenway, the Watershed Association is playing the key role of coordinating, and in many cases instigating, the actions of many other parties. In addition to spearheading initial efforts to design the greenway and bring it to the public consciousness, the Association has been the force which brings together sources of funding such as the Heritage Conservation and Recreation Service with the local agencies which want to acquire land. This has involved not only making the communities aware of funding opportunities, but also helping them with the often-complex paperwork necessary to receive financial assistance and non-governmental sources. Furthermore, it has established a fund to provide assistance to towns for survey and legal costs in land acquisition.

The Association also plays an active role when a landowner wishes to donate land or easements into the Greenway. Often, landowners are uncertain about which of the many federal, state, and local,

public or private institutions they should give their land to. The Watershed Association is able to supply them with information about the various organizations, how long they have been in existence, and how well their land is maintained.

The Association has found, however, that the initial contact with a landowner, in which the case is made for selling or giving land into the greenway, is best made by someone at the local level—for example, a member of the town conservation commission. This eases the landowners' fears that their property is being taken over by strangers, or some remote level of government.

Once the initial contact is made, however, the Association is able to play the role of facilitator between the landowners and the agency which is buying or receiving the donation. This stage can often be lengthy. For example, the Association's Managing Director carefully negotiated with one family for seven years before they donated their riverfront land to a conservation trust. Persistence, she says, is the key to making a greenway work.

Over the years, the Watershed Association has steadily increased its efforts on behalf of the greenway. It now includes a greenway director and a landscape designer, in addition to the regular staff. A regular newsletter, as well as special greenway publications are used to continually remind citizens and officials of the benefits of the greenway, and the progress that has been made to date. There have been some failures—for example, an attempt was once made to set up a revolving fund to help acquisition, but sufficient funds could not be raised—but by and large the greenway has a strong record of success and is well on its way to being realized. With waterfront public parks assured, and pollution cleanup progressing, residents may once again come to understand the Indian meaning of Nashua—"river of the beautiful pebbled bottom."

A new urban riverwalk in Washington, D.C. as a part of the Potomac River's "greenway" (above).

The San Antonio River Walk "greenway" which sparked the renewal of its downtown (facing page).

The Willamette River

The Willamette provides a dynamic example of how a greenway can be established through action at the state level, by a concerned governor and an active state legislature.

Fifty years ago, the Willamette River in Oregon was as filthy a river as can be imagined. Untreated sewage and industrial waste poured into it at rates intolerably high for even the winter months, when high precipitation kept the river flowing swiftly. In the summer, when rainfall was sparse and the flow of water dwindled, muck and debris which had formed sludge deposits on the bottom often surfaced to form foul-smelling floating rafts.

Oregon is, of course, famed for its environmental consciousness, and the 70% of the state's residents living in the river basin were certainly not going to let a situation such as that continue—even if the time was thirty years before the national environmental movement went into full swing. In 1938, voters approved three-to-one a statewide initiative to make it public policy to restore the purity of all public waters, and to set in motion the legal and institutional structures necessary to do so.

Progress was slow in the early years, and construction of facilities delayed by World War II. By 1957, many pollution control measures had been taken, but unfortunately a 73% growth in population and a 93% increase in industrial waste had conspired to keep water quality about the same. More stringent control measures were adopted in 1958, and again in 1964.

By 1966, enough change in water quality could be seen that the concept of a Willamette River Greenway was proposed. The state was in the midst of an election campaign, and both candidates for governor endorsed the idea.

Events moved at an unprecedented pace. Immediately after the election, the new governor appointed a task force of citizens and state and local government officials charged with defining the greenway concept and proposing actions to implement it. Simultaneously a group of citizens organized as the Willamette River Greenway Association to seek public support for the open space corridor.

The Task Force worked quickly, and within three months legislation was submitted. Within another three months, the greenway concept was law. As the Task Force said in its report:

"We must be astute to see that preservation is far easier than correction, perceptive enough to realize that in the Willamette River we still have more to preserve than to correct, and bold enough to act accordingly."

The Original Plan

The greenway plan as first enacted by the 1967 legislature had a number of interesting features:

- Because of existing development along the river, and expected opposition from some landowners, the original concept of a single continuous park was modified into a plan for a series of separate parks along the river. A total of 7,500 acres was slated for public purchase.
- Because much of the rest of the land along the greenway was compatible with the greenway as long as it remained in its current use—for example, agriculture—it was proposed that scenic easements be purchased on 6,500 acres of land, and recreation easements allowing for public access be purchased on another 1,400 acres.
- Because there was local resistance to assigning strong powers at the state level, acquisition powers were left in the hands of local governments, with planning and coordination only at the state level. Taking land by eminent domain was expressly disallowed.
- Initially, acquisition was to be financed half by the state and half by the local government. However, as federal Land and Water Conservation funds became available, the funding formula was changed to half federal, one quarter state, and one quarter local.
- In addition to the public parks dotted along the river, the greenway plan included a system of river camps for boaters, accessible for the most part only from the river or by trail; a "river access system" of boat launching sites; a system of trails for hiking, biking, and horseback riding; and a "scenic river

system" to take advantage of special views of the river.

Under this plan, of the 22,000 acres of land bordering the river, roughly a third was proposed for acquisition, a third was proposed for preservation through easement, and much of the remaining third was already in public ownership. In the first three years of implementation, 1,310 acres were acquired for the greenway, and although this was an impressive accomplishment, it constituted a mere 17% of the scheduled acquisitions.

The Plan Revised

Three major obstacles to implementing the greenway plan became apparent:

- Local governments had difficulty raising sufficient funds to meet their one-quarter share of acquisition costs, and their inaction proved to be the narrow place in the pipe. It was particularly noted that county governments were far less able to raise needed funds than city governments.
- The prohibition against use of eminent domain made implementation exceedingly difficult.
- The expectation that considerable acreage could be protected through donation or purchase of easements did not come true. The cumbersome legal procedure was found to be the most notable roadblock.

Public and political support for the greenway remained high, however, and thus workable solutions to these difficulties were found. A major step was taken in 1971 by establishing five new large state parks along the Willamette, paid for entirely by state and federal funds. With the two existing parks, this gave each of the counties along the river a major state-owned area.

This still left much land unprotected, however, and thus the further step was taken in 1972 of placing responsibility for acquisition of the remaining land in state hands, and including the power of eminent domain among the tools for land purchase. 15,700 acres were slated for acquisition, with the cost of $10 million to be borne half by the state and half through federal funds.

As this ambitious program got underway, however, farmers along the Willamette began to fear that their land would be vandalized by the recreating public, and that they might lose access to the river for irrigation water. They succeeded in having the program amended by the state legislature.

Revised Again

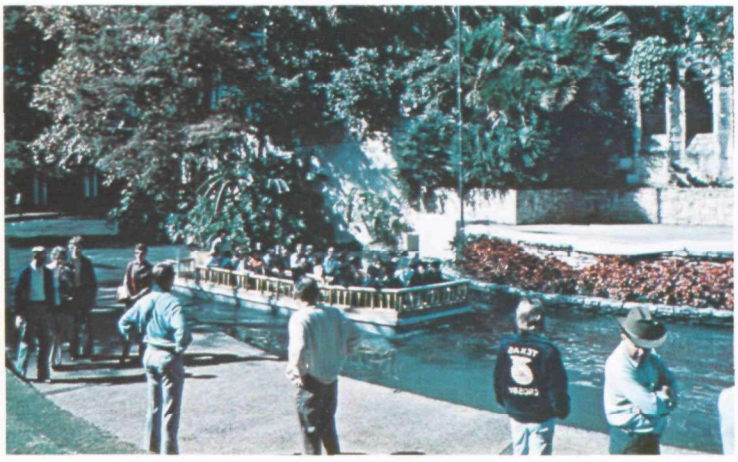
The compromise worked out by the legislature after many hearings and much negotiation tried to balance the concerns of farmers with the desire to preserve the shoreline. Scenic easements once again became the primary tool for greenway preservation. The law established the boundaries of the greenway as all lands within 150 feet of the high water mark, with the further provision that the state, in consultation with local governments, could specify within one year additional land for inclusion.

Within this boundary, the state can acquire scenic easements by gift, by purchase from willing sellers, or by use of eminent domain. The conditions of the easement can vary; for example, it might prohibit cutting timber, or damaging vegetation in any way, or constructing buildings, or any combination of these or other activities. Public access cannot be required, but can be included if the seller is willing. A scenic easement cannot be acquired on farm land, but if a farm is converted to any other use, an easement may be acquired at that time.

Use of eminent domain to acquire land has once again been prohibited, although the state is proceeding to buy land from willing sellers.

* * * * * *

Although it took many false steps along the way, much has been accomplished in the effort to create the Willamette River Greenway. Further, it serves as a model for other state governments to take the lead in preserving river corridors.



San Antonio's River Walk

The River Walk is a totally urban greenway, a demonstration of the marvels that can be accomplished within a developed city.

Located in the heart of San Antonio, Texas, the "Paseo Del Rio" or River Walk attracts nearly 2½ million visitors each year to its cosmopolitan blend of interesting shops, outdoor restaurants, flowers and greenery, Spanish architecture, and tour boats plying the shallow waters. It is the most outstanding example of an urban greenway, a tribute to this far-sighted city which began planning and redevelopment of its riverfront more than 40 years ago.

The River Walk is twenty-five to thirty feet below street level, set along a bend in the San Antonio River in the heart of the downtown area. In the 1930's, a new channel was cut to bypass the bend during floods, and this provided the impetus for development of the park. Proposals to culvert the river and develop parking or shops over it were staved off, and commercial interests joined with civic groups and government agencies to bring the imaginative River Walk plan to reality.

Today, the visitor descends via one of 44 stairways into the stunning beauty of the River Walk's carefully planted tree-lined paths and constantly flowering shrubs, there to enjoy not only the surroundings but also art galleries, theaters, cafes, craft shops, and a host of other attractions. The River Walk makes no pretense of being natural or unspoiled; rather, it glories in combining thriving economic development with a beautiful environment.

Visitor reaction to the area is overwhelmingly enthusiastic. In a survey undertaken during a study of the River Walk, visitors were asked whether they would vote in favor of developing a similar riverfront park in the city in which they lived. An astounding 76.6 per cent said that they would, even if it meant raising taxes.

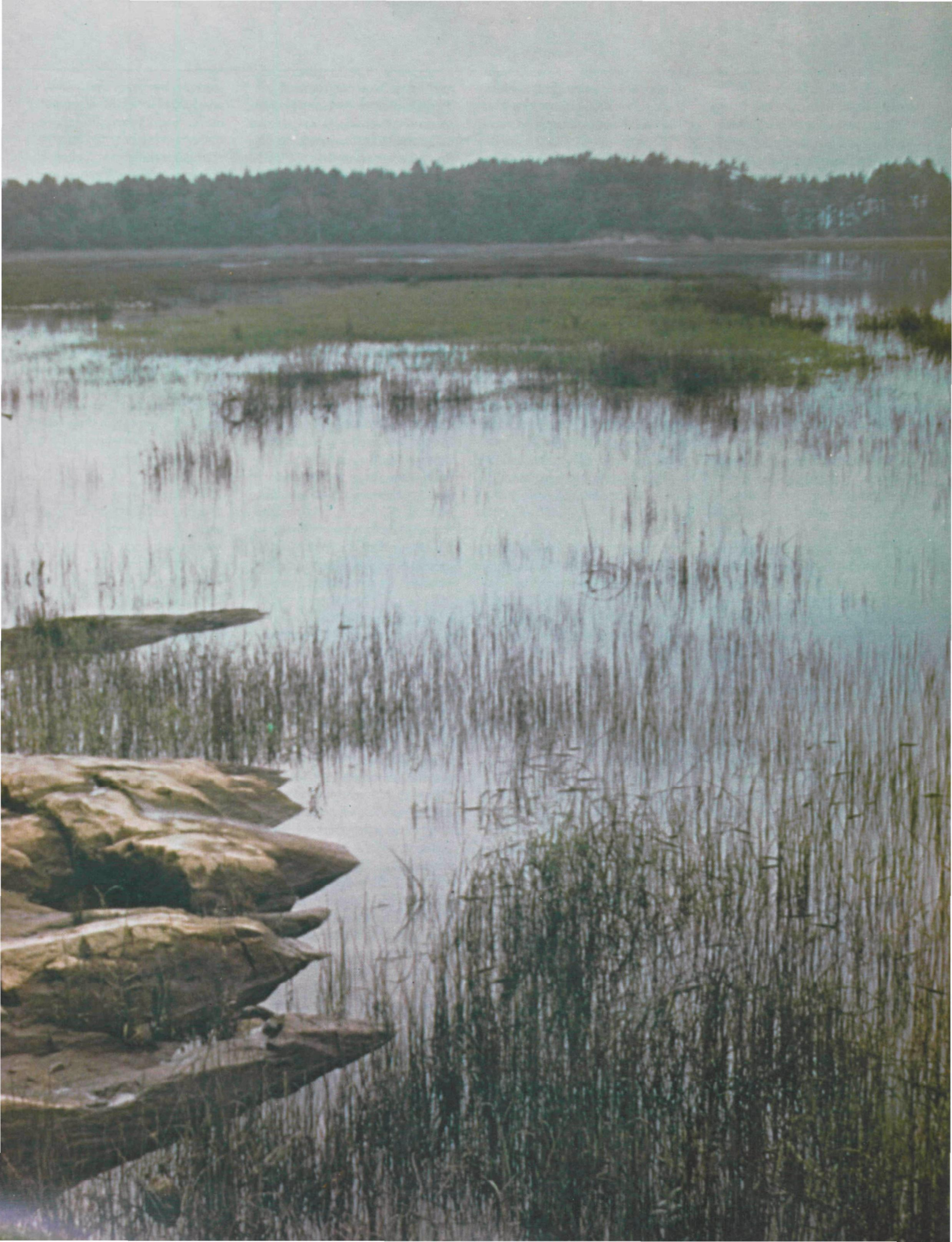
The Huron River

The Huron River Greenway provides useful lessons in how to bypass seemingly insurmountable physical obstacles.

The Huron River separates the two campuses of the University of Michigan at Ann Arbor, and during the 1960's development pressure along the banks of the river began to worry both the city and the university community alike. Despite the many obstacles to creating a greenway along the Huron, voters endorsed the concept and approved a $3.5 million bond issue for its development.

In a number of instances, imaginative solutions had to be found for physical interruptions in the greenway. For example, in one case, an electric substation blocked the only path for a bikeway and hiking trail; the solution, as shown below, was to build a wide walkway with parapet wall around the base of the building, and then a boardwalk under an existing vehicular bridge.

In another interesting case, landowners refused to grant an easement through their property for the walkway. The solution was to create a series of "stepping stone" islands across the river, connected by arching pedestrian bridges. The uncooperative landowners were bypassed, and the walkway continued down the opposite shore.



5

Water Cleanup and Land Use

Further considerations of water cleanup and the land include:

Allowing nature's way of water cleanup to continue.

The once-novel notion that water cleanup programs affect land has today become a commonplace fact. Communities across the nation have learned that construction of major public facilities such as wastewater treatment plants can lead to dramatic changes in the timing and nature of development patterns. Land that was once only marginally desirable or even unsuitable for building can become prime real estate, and the rising cost of operating and maintaining large public utilities has made community growth sometimes seem fiscally advantageous.

Similarly, scientists and water quality planners have increasingly turned their attention to the fact that the uses to which land is put can have tremendous impacts on water quality. As the "point source" discharges of water pollution—factories, untreated sewage outlets, overloaded municipal treatment plants—are made to comply with pollution standards, the "non-point" sources of pollution such as erosion and runoff, which are dependent on land use practices, become more and more important in meeting the mandate for waters clean enough to fish and swim. In many areas, the dirt and chemicals washed into rivers and lakes from city streets and farmer's fields rival in seriousness the more stereotyped pollution sources.

Citizens, federal officials, and state and local planners are moving now beyond simply studying these problems and increasing awareness of them, and into the area of finding and implementing solutions. Much progress is being made, and in areas increasingly vital to securing full public benefit from investments in water pollution control.

Reducing Adverse Land Use Impacts From Wastewater Facility Construction

The construction of wastewater facilities—both treatment plants themselves, and the sewer systems built to collect wastewater for treatment—might have adverse land use impacts in certain situations:

- Where a community has traditionally relied on septic systems or other on-site disposal practices, the construction of a public wastewater treatment facility can change the amount or type of development the community might expect, by making land more desirable to build on, by making it possible to build where high water tables, poor soils, or other factors make septic systems unworkable, or by making it possible to build at densities which are feasible only if waste is disposed of off-site.
- Where a community's growth has been slowed by inadequate capacity in existing treatment systems, construction of additional facilities with greater capacity will remove this limit, and may cause accelerated growth.
- It is a fact long recognized by planners that development tends to follow utility and transportation corridors. Just as new stores, offices, factories, and apartment buildings tend to cluster along new highways, so a sewer system laid out in an undeveloped area attracts housing developments. When a community plans its sewer system to channel growth where it wants it to occur, this is a beneficial effect; but when a sewer line must cross wetlands or agricultural areas, it increases development pressures on these valuable assets.
- Where a community has built a treatment facility that it finds expensive to operate, it may begin to seek commercial, residential, or industrial growth that it might otherwise not have had in order to spread the burden of municipal costs. But this growth, too, brings the need for more new services, and thus more costs, and the community may be embarked upon a spiralling pattern of growth.

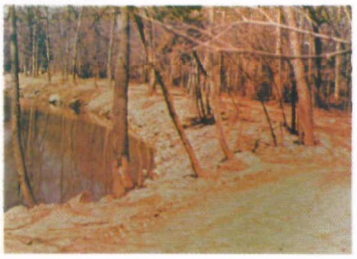
The Environmental Protection Agency has adopted the policy that applications for construction grants to fund wastewater treatment system must be analyzed to determine the possibility of "secondary effects" such as induced growth and land use changes. EPA's Program Guidance Memorandum No. 50 goes on to say:

Where careful analysis leads to the conclusion that the secondary effects of a project can reasonably be anticipated to contravene an environmental law or regulation, or a plan or standard required by an environmental law or regulation, the Regional Administrator shall withhold approval of a Step Two or Step Three construction grant until the applicant revises the plan, initiates steps to mitigate the adverse effects, or agrees to conditions in the grant document requiring actions to minimize the effects.

The Office of Land Use Coordination within EPA has published a case study series which documents innovative and effective ways to reduce adverse land use impacts from water cleanup construction programs. These cases are typical of the procedures that will more and more be applied around the country to obtain the broadest

"EPA is beginning to move away from the traditional "build a treatment plant solution" for every pollution problem. In many instances we are finding that modification of land use practices and even using the soil itself as a purifier of wastes can be a better environmental solution and cost far less for taxpayers as well. Ecologically-sensitive techniques of pollution control are going to receive a much higher priority than they have in the past."

Eckardt C. Beck
Assistant Administrator for Water and Waste Management
Environmental Protection Agency



Sometimes water cleanup projects temporarily disrupt the environment as in the case of this interceptor right-of-way. This can be compensated for by restoration practices which include public trails.

environmental benefit from water cleanup efforts.

The "Case Study Series on Mitigating Secondary Impacts from the Wastewater Facilities Program" highlights a number of techniques which can be applied for this purpose:

- phasing in the extension of sewer service as needed rather than making service available over a large area all at the same time;
- project changes, which might include items such as scaling down the facility, or building several smaller facilities strategically located, rather than a single larger plant;
- improved land use planning and zoning controls in affected communities;
- better coordination and planning among communities affected by a project;
- restrictions on sewer hookups, which can be accomplished through the legal mechanism of the treatment facility's National Pollutant Discharge Elimination System (NPDES) Permit;
- adoption or strengthening of environmental plans or programs, such as Air Quality Maintenance Plans, which will help ensure environmental protection in a growing community;
- improved land management practices to protect water quality, such as erosion control and floodplain management;
- use of wastewater treatment techniques, such as rehabilitating septic systems, which will lessen or eliminate the need for a centralized treatment facility.

Many of these techniques involve local land use planning and zoning controls, and thus require the cooperation of local officials. Yet this need not be an obstacle, and the case study series includes examples in which EPA provided the stimulus for better local planning, which was then taken up and carried out at the community level. One of the most interesting of these occurred in North Freemont County, Idaho.

The project involved a proposal for a large regional wastewater treatment facility to serve a relatively undeveloped area bordering on Yellowstone and Grand Teton National Parks. The land is both beautiful and environmentally sensitive, with much of the wilderness character of the adjoining parks. It is also a prime area for recreation and second-home development, with developers held at bay only by the fact that a high water table made septic systems unworkable on most of the properties.

Thus, the proposal for the regional facility generated a great deal of concern. Because of this, EPA decided to prepare an Environmental Impact Statement before funding the project, to determine what the potential effects of the project were, and to consider alternative solutions to the wastewater management problem.

As a result of this study, the project eventually undertaken was quite different from the original proposal. First, the basic plan was changed from one large facility to four smaller ones. This eliminated the long interceptor sewer lines which might cause strip development, and also allowed the plants to be built in phases as normal development pressures make them necessary. Service is confined to four sub-areas within the county which are designated as development sites. This plan was not only more environmentally responsible, it was also considerably more cost-effective than the original proposal.

In addition to this change in the nature of the project, EPA took the extra step of placing a condition on its grant of funds stipulating that the County must prepare a comprehensive land use plan, and growth controls to ensure that it will be followed. EPA based its authority for such a condition on the fact that state law called for development of such plans in all counties. The agreement between EPA and the County clearly specifies that 20% of construction funds will be withheld until the land use plan and zoning measures are completed.

Instances like North Freemont County in which land use problems potentially arising from construction of a treatment facility are so well resolved are, unfortunately, still the leading edge rather than the norm. Cases still abound where treatment facilities are designed with no recognition of their land use effects; or with studies in hand which outline those effects, but without comprehensive measures to prevent them. Vigilant oversight by community planners, public officials, civic and environmental groups, and ordinary citizens is the key to making sure that land use issues are adequately addressed in the construction of treatment facilities.

Preventing Repollution Through Shoreland Protection

When Congress overhauled the nation's water pollution control laws in 1972, it recognized that the goal of fishable and swimmable waters would not be met without controlling the pollution from land management practices. It therefore wrote into the Water Pollution Control Act a program, contained in Section 208 of the law, to plan for control of this pollution on a regional basis. The program has become known as "208 planning," although its more complete name is Areawide Waste Treatment Management Planning.

208 Planning is proceeding across the country. Areas which have particular water quality problems have been "designated," meaning that they receive special attention, and that the 208 program is carried out by a regional agency such as a council of governments or a regional planning agency. In the remaining non-designated portions of each state, 208 planning is conducted by the state agency responsible for water quality. Federal funds help pay for the programs, and the plans developed must be approved by EPA. More importantly, the plans must show how they will be carried out, and demonstrate that state, regional, and local agencies have or will obtain adequate financial and legal authority to implement the measures required.

Although 208 planning addresses the full spectrum of water quality problems and not just those related to land use practices, these non-point problems receive major attention because they are not addressed by other water quality programs. Among the important land use issues being addressed in 208 plans are the following:

- *Storm runoff in developed areas,* a serious problem because the large amount of pavement in suburbs and cities prevents storm water from being absorbed by and filtered through the soil, and instead sends it rushing into rivers and lakes with its full burden of chemicals, gas and oil washed off roadways, organic debris, and road salt;
- *Agricultural runoff,* which carries sediment, fertilizer, pesticides, herbicides, and animal wastes from croplands, feedlots, and pastures;
- *Loss of wetlands,* the swamps and marshes which act as nature's treatment plants, filtering and digesting harmful pollutants before they reach rivers and lakes, but which are being deliberately filled for development, or unintentionally filled by sedimentation and erosion at an alarming rate (nearly half of the nation's wetlands have been lost in the last 100 years);
- *Poor construction practices,* which result in increased erosion at construction sites, and substantially contribute to heavy sediment loads in nearby waters;
- *Poor forestry practices,* which involve poorly designed roads or skid trails, or destroy underbrush and leave large areas bare, again resulting in high concentrations of sediment and organic matter in streams and lakes;
- *Modifications to streams and rivers,* such as channelizing, building reservoirs, or destroying groundwater recharge systems, which change the flow patterns in waterways and thus effect their ability to absorb pollution, increase the danger of flooding in unprotected downstream areas, or adversely affecting fish and wildlife habitats;
- *Improper location or operation of facilities* such as solid waste disposal areas, mines, and chemical or petroleum storage areas, which can lead to contamination of both surface and underground water supplies with toxic chemicals or bacteria.

Addressing problems in these areas is not an easy task, yet doing so is important for the quality of both our water and our land. 208 programs around the country are reaching the stage where they must address solutions for the problems they have uncovered, and the support of citizens and municipal officials is critical in this phase. Your community, like every other, can take steps to modify its land use practices for the sake of water quality. Like Tallahassee and Leon County in Florida, for example, it could adopt standards for new construction which require that runoff from developed areas does not exceed natural flows. Developers meet this standard through techniques such as paving streets and parking lots with porous materials, building retention basins, or leaving portions of land under vegetative cover.

Or, as has been done in Michigan, a state or community can institute a system for controlling erosion at construction sites. Under the Michigan program, a soil erosion plan must be prepared for any development one acre or larger, or a development of any size if it is within 500 feet of a lake or stream. Until the erosion plan is approved by the county, a permit for construction may not be issued. Administrative costs for the program are covered by the permit fees.

The possibilities for action are numerous, the chances for success dependent on the support of citizens and public officials. If effective measures to control non-point sources of pollution are not enacted, pollution of the nation's waterways will remain at unacceptable levels. If effective measures *are* adopted, the benefits for us all will be substantial.

A recent EPA publication entitled "Clean Water and the Land: Local Government's Role" identified a number of poor land use practices which lead to lowered water quality. The list includes a variety of practices that can be addressed through the choices of private individuals, or the policies of local governments:

- *Overusing lawn fertilizer or road salt, or piling leaves in the gutters of urban streets;*
- *Cleaning streets infrequently, with the possible result that the "first flush" after a storm in an urban area carries large quantities of chemicals, debris, and organic materials;*
- *Using unnecessarily large areas of pavement in cities and suburbs, which increases urban runoff;*
- *Overusing agricultural fertilizers, allowing animals direct access to streams, and other agricultural practices;*
- *Failing to take measures to reduce soil erosion during construction, or during agricultural and forestry operations;*
- *Locating housing with septic tanks on unsuitable soils;*
- *Failure to take measures to reduce or prevent mine wastes and petroleum and chemical spills from reaching the waters;*
- *Locating and designing waste disposal sites so that they leach (filter down) into water sources;*
- *Filling and using wetlands for urban development and agriculture.*

Using Water Cleanup By-Products To Improve the Quality of Land

As clean water programs progress, and wastewater is subject to better treatment before it is discharged, the question arises of what to do with the sludge that results from treatment processes. There are a variety of solutions, such as incineration or landfilling, but the one which best meets the theme of obtaining the broadest environmental benefit from clean water programs involves treating this by-product as a valuable resource, not a disposal problem.

Sludge is rich in nutrients and makes an excellent soil builder. Increasingly, therefore, it is being applied to the land with a variety of beneficial results. These include improvement in the fertility of the land, elimination of conventional sludge disposal problems, recharge of groundwater sources with the purified water which trickles through the "natural filter" of the soil, and sometimes, recreation benefits as well. Methods for using sludge range from processing it into clean and odorless fertilizer which is bagged and sold commercially, to land application of sludge in less processed form; to spray-irrigation of partially processed liquid effluent over large areas of land, allowing the soil to complete purification of the wastewater through natural processes.

There are many successful examples of communities using these techniques. The city of Milwaukee, for example, has sold its sludge as a commercial fertilizer for a number of years, with nationwide markets. Other cities are actively investigating this possibility. In Illinois, sludge from treatment plants in Chicago is being used to reclaim thousands of acres of strip-mined land in Fulton County. Yellowstone Canyon Lakes park in Lubbock, Texas—as described earlier—makes use of wastewater, filtered through a nearby farm and then pumped out of underground reservoirs, to fill artificial lakes for recreation.

Muskegon County in Michigan uses spray-irrigation to treat its municipal wastewater, with a variety of interesting benefits. The waste is piped to an 11,000 acre site ten miles east of the city where, after going through aeration and settling ponds, it is sprayed on 54 fields. In 1975, the county produced a $600,000 cash crop of corn on the site, which contributed substantially to reducing the costs of the project. Islands of trees scattered between the fields, combined with two large holding ponds, have made the area an ideal wildlife habitat.

Examples such as these demonstrate the promise of innovative wastewater management techniques. Though they are not necessarily suitable in every area, and problems can be associated with them, communities should make sure to include consideration of such possibilities among the alternative waste treatment practices studied in the wastewater facility planning process.

6
Challenges for Action

As water cleanup continues, enormous pressures will occur to line our waterfronts solidly with private developments—

The first Water Cleanup and the Land Conference in 1975 assembled a distinguished group of participants, including prominent environmental and consumer representatives from several states, top administrators and political figures from the national, state, and local levels of government, and participants from business, the academic community, and technical and professional societies. One of the primary results of the program was a series of action recommendations hammered out by these people in small group discussions.

Much progress has been made in the intervening years and a number of recommendations fulfilled. By and large, however, the action needs identified were long term in nature, and many of the conference recommendations still define the areas where progress is to be made:

1) Develop avenues of communication between the Environmental Protection Agency, the Heritage Conservation and Recreation Service, and other relevant federal agencies, at both the policy and operational levels. A Joint Memorandum of Understanding can provide the framework for cooperation, but day-to-day communication needs to be increased. Similar communication and cooperation is needed at the state level as well.

2) Review both legislation and agency regulations and seek changes which will encourage multiple use and coordination of land acquisition with water cleanup schedules.

3) Make better use of existing inter-agency and public review processes, such as Environmental Impact Statements and A-95 Review. Strong support from agencies could bolster the A-95 mechanism, through which agencies are required to comment on each other's proposals. Too often these comments are perfunctory rather than careful and analytical. Review processes should be more open to public participation, and agencies should be required to consider the public impact they receive. Additionally, Environmental Impact Statements could be better used to explore the land use effects of water cleanup, and alternatives for waste management and multiple use.

4) Improve the flow of information, both within and between agencies, and between agencies and the public.

5) Increase the public's understanding of waste treatment and water pollution control.

6) Take immediate steps to increase participation by citizens in EPA programs.

7) Establish a special consideration for "Streambelt Funding" within the Land and Water Conservation Fund. This would help focus attention on acquisition of land alongside waterways, especially for areas where federal funds had been used for waste cleanup.

8) Increase the ratio of federal share for land acquisition to overcome the strain on local government budgets.

9) Revise Statewide Comprehensive Outdoor Recreation Plans (SCORP's) to emphasize waterfront acquisition. Although existing regulations prescribe special attention to waterfront lands, conference participants felt that adequate consideration was not yet being given them. The Heritage Conservation and Recreation Service could exercise leadership with states in this area.

10) Promote the use of easements as a means of land protection.

11) Require that facility plans explore opportunities for multiple use of facilities and joint development of the environs.

12) Make better use of the important opportunities provided by Section 208 Areawide Waste Treatment Management Planning, by considering open space, multiple use and recreation potentials in the planning process. Develop specific implementation steps such as easements, zoning and tax policies.

13) Conduct inter-agency training programs on multiple use and joint development.

14) Encourage the use of innovative wastewater treatment methods. Of particular interest to conference participants were "non-structural" waste management practices which use the land as a living filter, rather than high-technology physical structures.

15) Develop and publicize demonstration projects. Interesting examples of multiple use, joint development, coordinated land preservation, and innovative treatment methods should receive widespread publicity, and be particularly brought to the attention of federal, state, and local officials.

16) Develop and publicize information on the water quality impacts of various land uses.

17) Improve planning capability at the local level. Over and over again, conference participants emphasized the importance of the role played by local government in water cleanup and the land. As the recipients of federal help who must mesh together diverse programs,

local governments have to make sense out of what was not made sense of at the state level or the federal level. There was equal agreement in the Conference, however, that local governments were not equipped to deal adequately with water cleanup and the land issues. Therefore, it was strongly recommended that the Environmental Protection Agency, the Heritage Conservation Recreation Service and other federal agencies continue and expand their technical assistance programs whereby agency personnel are available for consultation with local governments.

18) Mobilize citizens and local officials. It is the interest and participation of citizens that breathes vitality into government programs, and this public involvement is particularly needed in a case such as"water cleanup and the land"; when the program concept is both new and requires coordination by several government agencies. Do not assume that agency officials with a thousand other things to do will automatically follow new procedures unless there is an interested public urging them to do so.

Local officials are on the front line in making decisions affecting water cleanup and the land. Over and over again, the Conference participants emphasized the importance of local officials in these programs, and the key role they can play in implementing action programs.

Encourage greater recreational opportunities in Section 314 Clean Lakes projects by participating in the early planning phases of individual projects and state programs.

The concept of public participation permeates water cleanup programs and Congress mandated it for all activities conducted under the Water Pollution Control Act. It is a major component of recreation programs as well, particularly the Statewide Comprehensive Outdoor Recreation Plans.

If citizens care enough to become involved in these various programs, and officials encourage their concern and harness it toward constructive input, not only will individual programs be improved but they will also be better coordinated to reflect the needs and aspiration of communities and to secure full value on the public's investments in water pollution control.

Whoever you are, whatever your job or civic activities, there's something you can do. Get involved in recreation and water quality planning. . . .

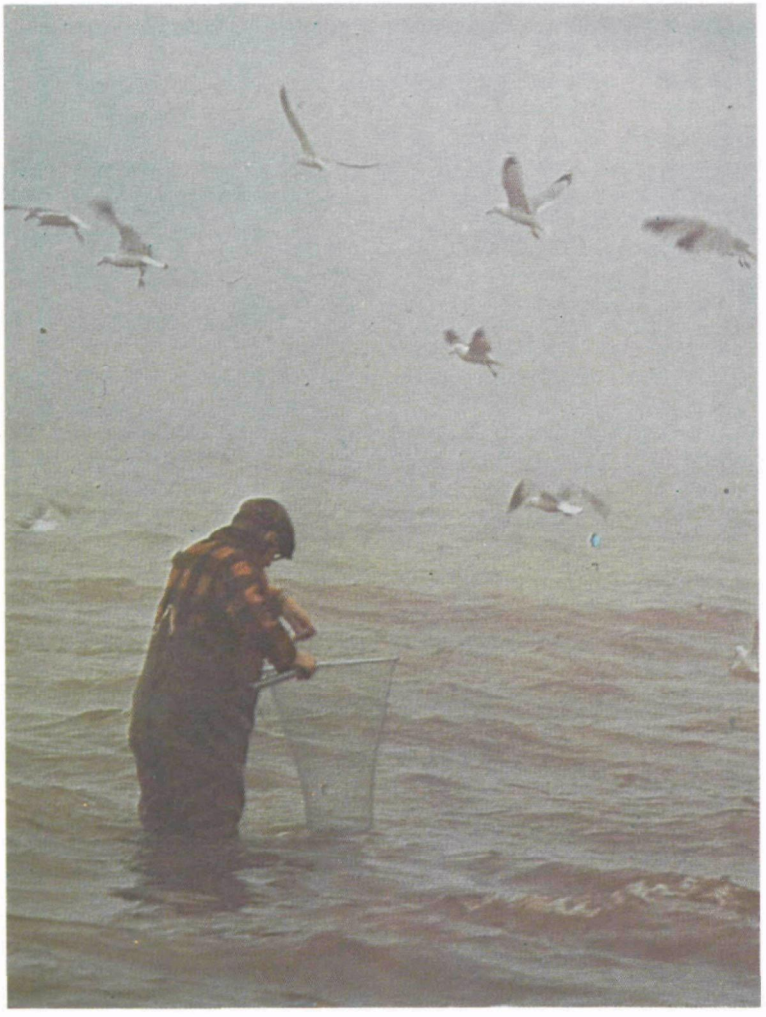
The Clean Water Act: Not just a matter of chemical makeup—but providing for the public's full use and enjoyment of fishable, swimmable waters.

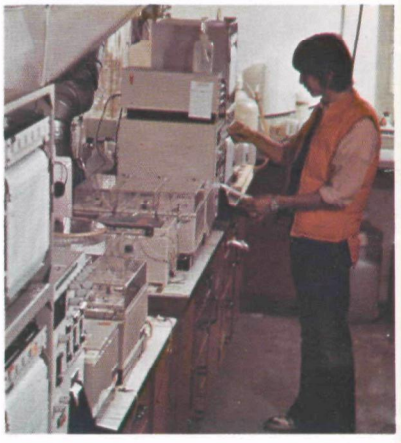
"Each generation has its own rendezvous with the land. Over the two hundred years of American history we have seen the full circle of exploring a virgin wilderness, conquering the diversities of geography, despoiling and polluting air, water, and land, ony to realize that unspoiled land and a pure and enjoyable environment are an essential part of our lives.

"Now we as a people are engaged in a massive effort to halt pollution and create a healthy and enjoyable environment. One of the results of this effort is that our generation is creating a new frontier along its urban waterfronts and rural riverways. Long abandoned to blight, these areas are becoming the focus of revitalized cities and the centers of recreational enjoyment. The importance of renewing waterfront landscapes and assuring public recreation opportunities at the same time that we clean up the Nation's waters cannot be overstated. The citizens of America have already invested their tax dollars in clean rivers and lakes. Unless we provide enjoyable waterfronts with guaranteed public access, most American taxpayers experience little direct return on their investment.

"It is the ordinary citizen who stands to benefit most from the policy of coordinating recreation and water quality programs, the ordinary working people and their families who have supported water quality goals in the voting booth and through their taxes, who want and need water oriented recreation areas, particularly recreation areas that are close to home."

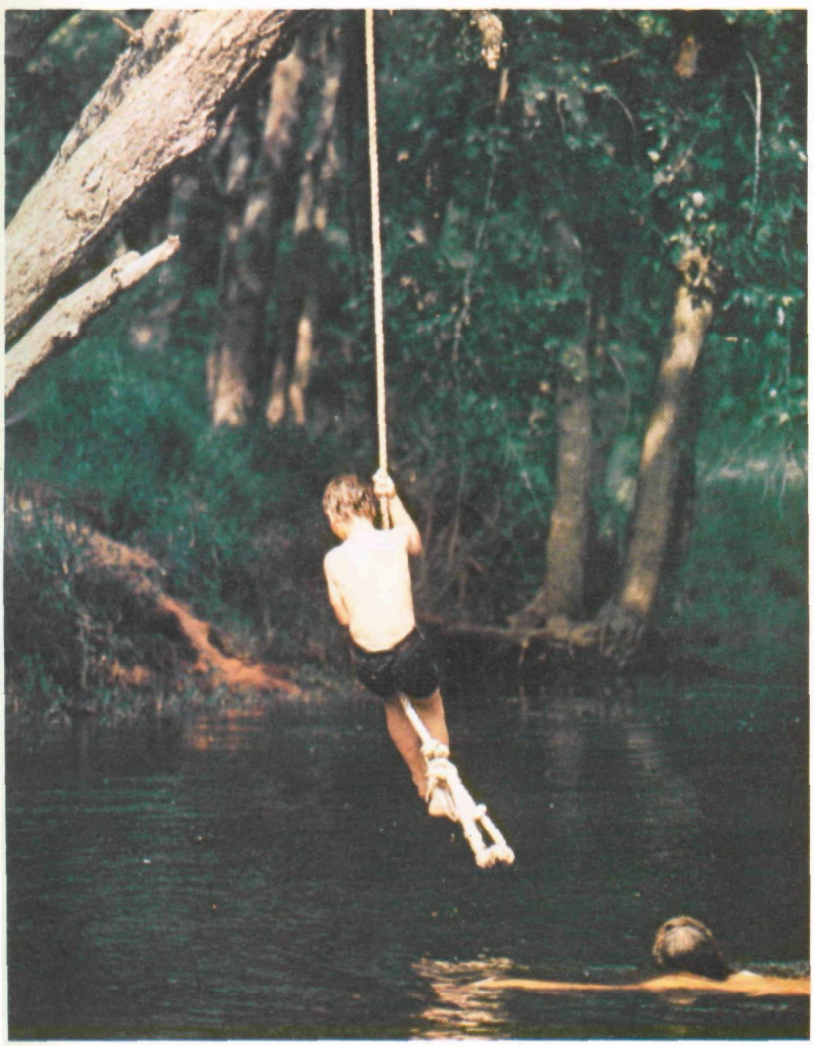
Douglas M. Costle
Administrator
Environmental Protection Agency





"It was the consensus of the workshops that . . . a more interdisciplinary attack on the problems (of water cleanup) must prevail. . . Natural stream corridors are part of a complex and integrated system for the treatment of polluted waters that does not end at the outflow pipe. These systems as a whole are important to water cleanup and should be considered in planning for that cleanup . . . The public's support of clean water, and its vote in favor of the programs which have been established was based on a concept of 'clean water' which includes the entire waterway, not just the chemical makeup of the water as viewed under a microscope."

Bradford Northrup
Eastern Regional Director
The Nature Conservancy



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